

PURCHASING

April, 1944



W. E. CUMMIN on
"DOING THE IMPOSSIBLE"
See Page 75
APRIL, 1944

Producing 50 times as much



ALUMINUM fighter and bomber "skins" are produced 50 times faster than before Pearl Harbor by this continuous strip mill. That's one of the reasons America now leads all countries in aircraft production.

Speeding output in all branches of industry, management is solving many of its mass-production problems through Texaco Engineering Service and Texaco Petroleum Products.

So effective have Texaco lubricants proved that they are definitely preferred in many fields, a few of which are listed below.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States. The Texas Company, 135 E. 42nd St., New York 17, N. Y.

THEY PREFER TEXACO

- ★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.
- ★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.
- ★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.
- ★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.
- ★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.



TEXACO Lubricants, Fuels and Engineering Service

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT - CBS



HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

PURCH

"There are two good reasons why that Century Motor helps me on my job — First, it helps the grinder to run smoother and I get out more pieces with less rejects. Second, I don't worry about metallic dust, coolant mist or solution getting inside and destroying the insulation."



**You Help Maintain
Machine Accuracy When You
Take Advantage of
CENTURY MOTORS'
Unusual Freedom From Vibration**

To maintain a high rate of production with the fewest rejects on an accurate grinding job such as that illustrated above, two major conditions must be met. Certainly there are other considerations, but watch for these two basic points —

- 1.** The motor must be smooth starting and running so that it will not transmit appreciable vibration to the machine.
- 2.** The frame construction must protect the motor from the hazards of surrounding atmospheres.

These two major considerations, plus many others, were considered by the Century engineers who recommended the Century motor for the application shown here, as well as for many thousands of others.

Call in a Century engineer to assist you with your electric motor application problems. His experience and advice may prove valuable to you.



1/20 to 600 horsepower

CENTURY ELECTRIC COMPANY, 1806 Pine St., St. Louis 3, Mo.

Offices and Stock Points in Principal Cities



"Ducks" Made of Inland Steel



Our fighting men call this 2½-ton amphibian truck the "duck", because it travels equally well either on land or in the water. Its water-tight steel hull encases the frame assembly below which are mounted the springs, brackets, and wheels—it is a motorized boat on wheels. In the water the "duck" is driven by a rear mounted propellor.

At battle fronts these seagoing trucks serve our fighters by establishing beach heads and bridge heads, by carrying men and supplies from ocean freighters—across beaches, lakes and rivers to inland depots. They are used in reconnaissance work in coastal waters, and

over land where roads and bridges do not exist. They can often be seen pulling artillery into position.

Inland Steel Co. supplies thousands of tons of plates and sheets used in the construction of these unique amphibian trucks—or "ducks." Other large tonnages of flat rolled products move daily from the Inland mills to builders of many types of transport, such as ships, trucks, barges, etc.

When the war is won steel from Inland will again be used to fill the peacetime transportation needs of the country.



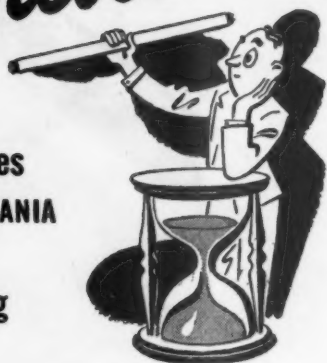
INLAND STEEL COMPANY

38 S. Dearborn St., Chicago 3, Ill.

Sales Offices: Milwaukee • Detroit • St. Paul • St. Louis • Kansas City • Cincinnati • New York

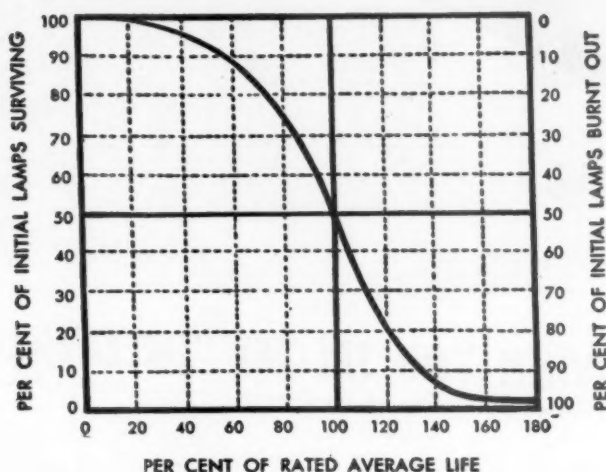
Fluorescent operating hints

No. 2 of a series
published by SYLVANIA
for all users of
fluorescent lighting



HOW TO GET FULL LAMP LIFE

Average rated life of good-quality fluorescent lamps is 2500 hours for the 40-watt size — 3000 hours for the 100-watt size. But the life of individual lamps may vary as the chart shows:



And actual operating conditions seldom are as favorable as controlled laboratory tests. Nevertheless, these average rated life figures will help you estimate how many lamps you will normally replace every month. Simply use 2500 or 3000 hours as indicated in this formula:

| |
|---|
| $\frac{\text{Expected lamp renewals per month}}{\text{No. of lamps} \times \text{average burning hours per month}} = \frac{\text{Rated average life of lamps in hours}}{\text{Expected lamp renewals per month}}$ |
|---|

If your actual monthly replacements consistently exceed the calculated figure in your own formula, it will pay you to check these five factors, which shorten lamp life:

1. TOO FREQUENT STARTING: Average rated life is based on lamps operating for not less than four hours every time they are started. More frequent starting dissipates the filament coating vital to fluorescent performance — and thus shortens lamp life.

2. DEFECTIVE STARTERS: Starters that are not working properly may cause the lamp to blink off and on, a condition that also shortens lamp life. Sylvania Starters cost only a few cents and should be replaced as necessary to protect your lamp investment.

3. VOLTAGE VARIATIONS: Fluorescent lamps are made to operate within specified *ranges* of voltage — for example, 110-125 volts. Variations within the specified voltage range do not seriously affect a lamp. But at voltages much below the range, starting becomes uncertain, and there is an excessive drain on electrode material — with a resultant toll on lamp life. Above the normal range, there is also a life-shortening effect. In addition, light output also is affected by voltages outside the normal range.

4. LOW TEMPERATURE: Fluorescent lamps are designed to operate most efficiently between 60 and 90 degrees Fahrenheit. If low temperatures are unavoidable, lamps may be protected with enclosed fixtures.

5. EXCESSIVE VIBRATION: This reduces lamp life and can often be prevented or minimized.

*For Additional
Maintenance Information*
Send for this Free Booklet
100,000 already distributed



SYLVANIA ELECTRIC PRODUCTS INC.

"Fluorescent at its Finest"

SALEM, MASSACHUSETTS

FLUORESCENT LAMPS, FIXTURES AND ACCESSORIES, INCANDESCENT LAMPS, RADIO TUBES, CATHODE RAY TUBES, ELECTRONIC DEVICES



You get more than a fine tap WHEN YOU SPECIFY "GREENFIELD"

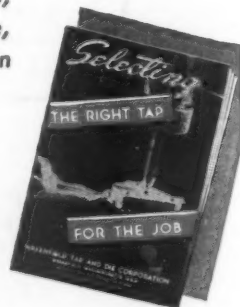
THE phone rings. "We're having trouble with our tapping operation. Can you send a man?"

"Greenfield" can . . . and does. Because "Greenfield" feels its responsibility is not only to produce fine threading tools, but also to help customers get the most out of them through proper selection and use. Its responsibility ends only when its customers are getting top threading performance. That is one reason why you get more than a fine tap when you specify "Greenfield."

There are "Greenfield" field representatives in Ashville, Atlanta, Boston, Chicago, Cleveland, Dallas, Dayton, Denver, Detroit, Fort Worth, Hartford, Jacksonville, Los Angeles, Milwaukee, Nashville, New Orleans, New York, Philadelphia, Pittsburgh, Portland (Ore.), St. Louis, Salt Lake City, San Francisco, Seattle, Syracuse.

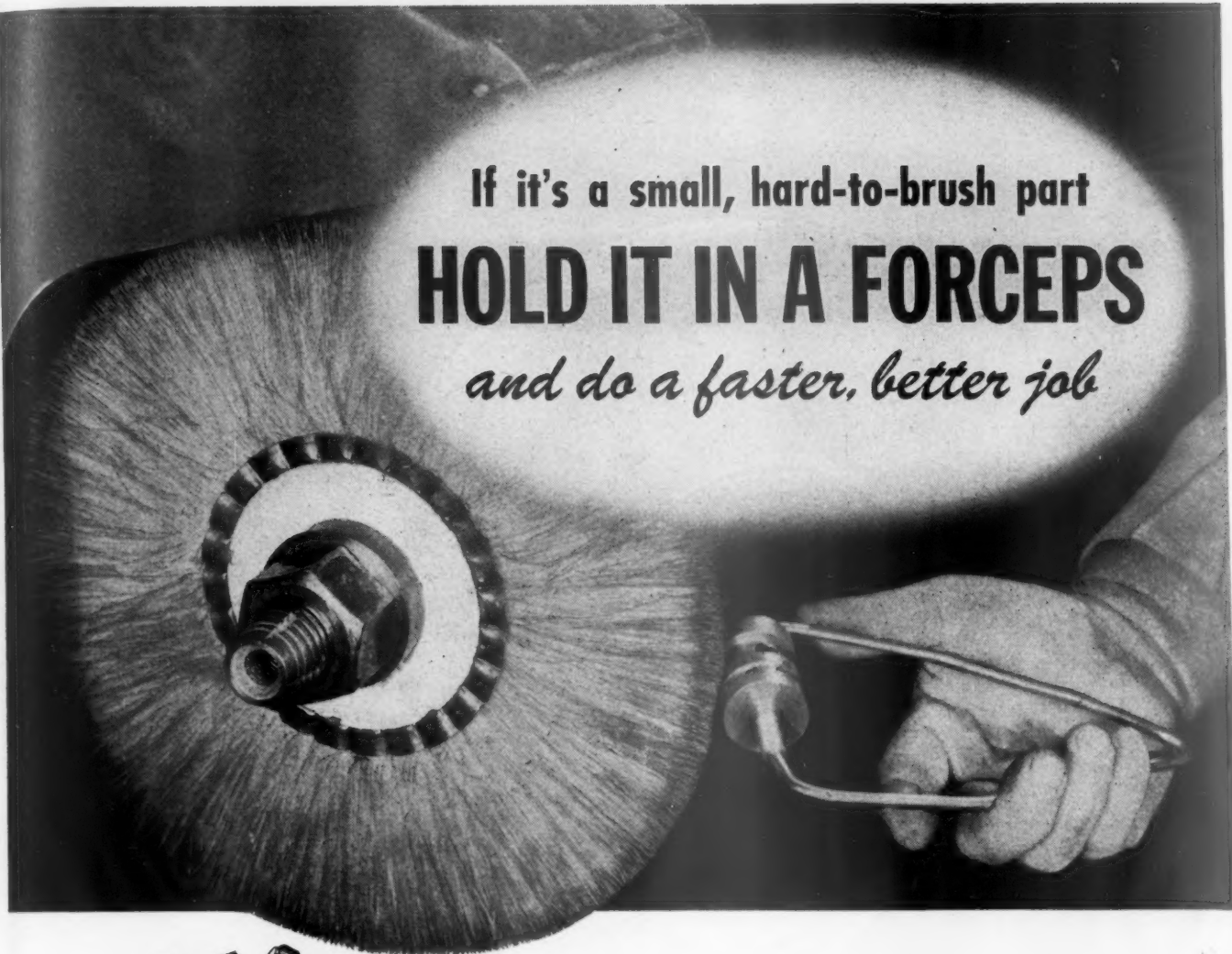


Have you copies of our new booklet "Selecting the Right Tap for the Job" which summarizes the data needed in ordering taps? It's yours for the asking.



GREENFIELD TAP AND DIE CORPORATION • GREENFIELD, MASS., U.S.A.

If it's a small, hard-to-brush part
HOLD IT IN A FORCEPS
and do a faster, better job



S MALL parts are often difficult to brush by hand. It's slow, tedious, finger-wearing work.

You can make an inexpensive forceps fixture, like the one illustrated, to speed up production . . . make it easier for the operator to do a better, more uniform job . . . at a lower operating cost.

This fixture is readily applicable to many burring, cleaning and polishing operations. It can be used effectively on hundreds of parts similar to those illustrated on this page . . . either to hold the work stationary, or let it spin against the brushing wheel.

This is just one of the small things that

loom big in the overall production picture—brought to light by the Osborn Brushing Analysis. This fact-finding engineering survey, originated by Osborn, is a detailed study showing how brushes, or different types of brushes, can increase efficiency in your plant.

Due to wartime pressure this complete O.B.A. service has been necessarily curtailed, but we can now look forward to the day when it will again be available to all, and as always, free of charge.

Meanwhile, if you have a critical situation where vital production is being impeded, call us for an O.B.A. We'll do our best to take care of you.

THE OSBORN MANUFACTURING COMPANY

5401 Hamilton Avenue

Cleveland, Ohio

Osborn  **Brushes**

WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY



Macklin Thread Grinding Wheels are tops. No job too tough. They give best results, hold the close tolerance with less dressing and give longer wheel life. Let Macklin solve your thread grinding problems.

**MACKLIN HIGH QUALITY WHEELS
FOR EVERY GRINDING PURPOSE WILL
"PROTECT YOUR PRODUCTION"**

Ask for the services of a Macklin Field Engineer

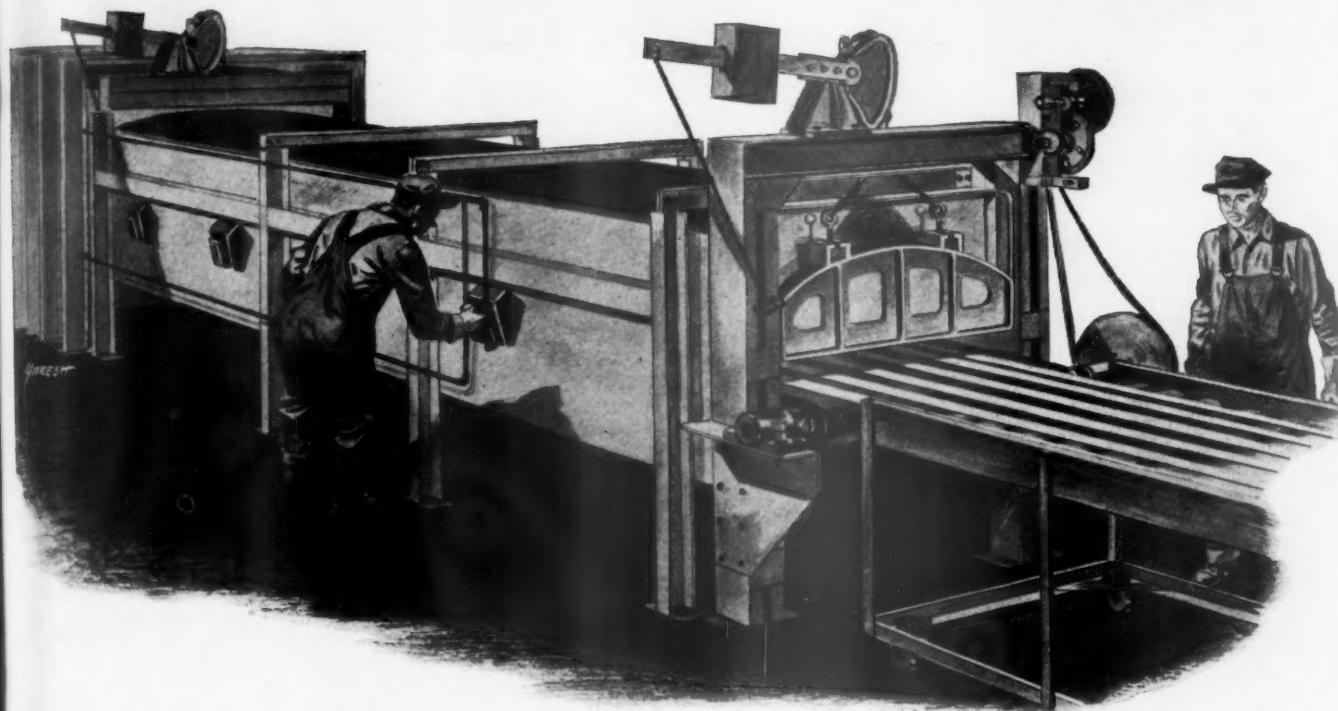
MACKLIN COMPANY

Manufacturers of GRINDING WHEELS — JACKSON, MICHIGAN, U. S. A.

Distributors in all principal cities

Sales Offices: — Chicago — New York — Detroit — Pittsburgh — Cleveland — Cincinnati — Milwaukee — Philadelphia

The Steel that makes watches tick— and Corsets fit snugger



WATCH springs and corset stays are rarely seen by the person who uses them, and neither are piston rings or bomb fuses. But the function served by those little parts in the finished product, *is* mighty important to the user.

Athenia Steel Company has always specialized in producing high-carbon steel for exacting purposes. It has meant the sacrifice of volume production, in favor of the old Swedish method of making steel in smaller,

controllable batches. It has meant the development of real craftsmanship in every employee in our mill.

That policy has won us many friends, and in our 30 years of business we honestly don't know of a single dissatisfied Athenia customer.

If you have a precision steel problem that involves stock in widths of $\frac{1}{16}$ " to $6\frac{1}{2}$ ", thicknesses of .0015 to .062—annealed, cold rolled, tempered, or tempered polished and colored—why not try Athenia Service?



Divisions of National-Standard Company

ATHENIA STEEL

Clifton, N. J.
COLD ROLLED, HIGH-CARBON
SPRING STEEL

NATIONAL-STANDARD

Niles, Mich.
TIRE WIRE, FABRICATED BRAIDS
AND TAPE

WAGNER LITHO MACHINERY

Hoboken, N. J.
LITHOGRAPHING AND SPECIAL
MACHINERY

WORCESTER WIRE WORKS

Worcester, Mass.
ROUND STEEL WIRE, SMALL SIZES



GET THIS

"Know-How" Information

USE COUPON BELOW

FOR YOUR PLANT

☐ **1. WIRE GROMMET V BELT**—Four page folder features information on recently announced wire grommet type of V belt. Said to be built with exceeding high tensile strength, high resiliency to resist shock, and to assure but little permanent stretch. Allows considerable increase in hp ratings. Will be furnished only on special jobs where belting engineers decide that standard belting cannot be used. B. F. Goodrich Co.

☐ **2. VALVE SELECTION CHART**—Purchasing Agents should find this chart invaluable when selecting valves. Explains conditions to consider and breaks down these conditions to determine how they affect valve operation. Easy to follow and understand. It is printed on heavy cardboard. Size—11½" x 17". Reading-Pratt & Cady Divn., American Chain & Cable Co., Inc.

☐ **3. ALUMINUM HANDBOOK**—Post-war ideas. Twelve economic advantages of aluminum are illustrated with numerous examples in this attractive 8½" x 11" brochure. These include light weight, high resistance to corrosion, workability, strength in alloys, etc. How some of the products have been "imagined"—that is, how imagination and engineering have been combined is described. Check No. 3 for your copy. Aluminum Co. of America.

☐ **4. STRUCTURAL STEEL SHAPES**—This handbook issued by U. S. Steel upon the recommendation of the Office of Production Management, provides data pertaining to simplified list of structural shapes in general usage and includes nominal dimensions, weights, properties and dimensions for detailing. Those listed are the only ones available. A few bar size

shapes permitted under L-211, Schedule 15, are also included.

☐ **5. TRUCK TIRE CARE**—B. F. Goodrich has published a well illustrated booklet which gives causes for tire failure and explains the necessary antidotes. Among factors illustrated are results of overloading, improper inflation, excessive speed, impacts, cuts, etc.

☐ **6. SPEED MILLING**—Technical bulletin No. GT-174 of 14 pages contains information on high speed milling of steel with cemented carbide tipped cutters. Factors which must be considered in designing a carbide cutter for jobs where optimum cutter performance justifies individual tool design are treated in detail. Special design is not needed for every carbide cutter. Carboloy Co., Inc.

☐ **7. PURCHASE FORMS**—You will be interested in this portfolio of forms. Eliminating carbon-handling, wiping out duplicated effort, and reducing errors and delays are some of the advantages claimed for the forms. Included are 12 different purchase forms, United Autographic Register Co.

☐ **8. ANTI-FRICTION BEARINGS**—Small booklet details principles of anti-friction bearings, explains why precision is important and diagrams the different ball bearing types. Identifies series numbers and presents explanatory list. Purchasing Agents will find suggestions for ordering valuable. Ahlberg Bearing Co.

☐ **9. MINE SUPPLIES**—Catalog No. 44 details all types of mine supplies. Rail bonds in 18 different styles are listed and these are claimed to meet every bonding requirement. Switches, welding machines

and trolley accessories are among products described. Mosebach Electric & Supply Co.

☐ **10. MATERIALS HANDLING**—Bulletin 32 covers Lo-Veyors for conveying bulk materials. Of vibrating type, they are self-contained units and can be installed on the floor or suspended from above. Data on applications and specifications of open, covered pan, tubular types given. Ajax Flexible Coupling Co.

☐ **11. LUBRICATING SYSTEMS**—How to save man hours, machine hours, materials and power is explained in bulletin 671 through use of a system claimed to automatically supply lubricant to every bearing. Three types are illustrated: the time clock controlled system, push-button, and manually operated systems. Engineering data is included. Lincoln Engineering Co.

☐ **12. PIPING CODE REQUIREMENTS**—This bulletin (42-C) explains the rules and requirements of two different codes which cover design fabrication and erection of high pressure steam, boiler feed and blow-off piping. The codes are the A.S.M.E. Boiler Construction Code for Power Boilers and the A. S. A. Code for Pressure Piping. The agreements reached by a committee which considered the overlapping jurisdiction of the two codes are explained. Midwest Piping & Supply Co., Inc.

☐ **13. THERMOMETERS**—Specifications on some types of chemical, clinical and laboratory thermometers for a variety of uses are given in this 52 page catalog #44. Faichney, A.S.T.M., and M.C.A. specification thermometers are illustrated and described. Temperature conversion table occupy three pages. Faichney Instrument Corp.

☐ **14. PROCUREMENT CONTROL** is one of several management controls described in detail in new book "Graph-A-Matic Management Control" now available from Remington-Rand, Inc. Effective operation answers to various problems are illustrated and described in this book which presents the latest method of controlling production, material, procurement, personnel, sales and accounting systems. Check #14 for your copy.

☐ **15. SLIDE & BUTTERFLY VALVES**—for regulation of air, gases, steam, water, and other fluids are detailed in catalog 406. Valve can be opened to any degree and when fully open, has same diameter as pipe line. Available in either threaded or flanged connections, and of almost any type of materials—plated, coated with other metal or plastics, or rubber-lined. Diagrams, dimensions and instructions for ordering included. W. S. Rockwell Co.

(Continued on page 12)

PURCHASING

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Four pages of "Know How" — 10-12-14-16

FINISHING TOUCH

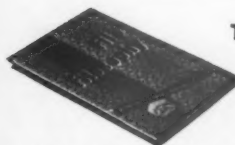
...TO SPEED THE GOOD SHIP

HERE you see a ship's propeller blades being given a last-minute dressing—to add that fraction-of-a-knot which may mean the performance of some vital war errand in the nick of time.

As on thousands of equally unusual sharpening, fitting or finishing jobs, a *file* is the tool used for the work. For, to assure the desired result under any one of countless conditions, there is no substitute for the combination of human skill and *The right file for the job.*

With metals, alloys and other materials increasing in variety, the latter becomes a more and more important requisite—in shipyard and plane factory, industrial plant and machine shop, tool room and repair shop, on oil, mining and farm equipment maintenance.

Nicholson and Black Diamond brands comprise literally *thousands* of kinds, cuts and sizes of files. Included are many special purpose files for such materials or operations as stainless steel, aluminum, brass, lead, plastics, foundry castings, die castings, die making, lathe filing, saw sharpening . . . plus a complete range of X.F. Swiss Pattern files for "precision" industries or departments. The Nicholson guarantee: *Twelve perfect files in every dozen.*



THIS 48-PAGE BOOK FREE

Invaluable to production and purchasing heads, shop foremen, machine and tool shop operators, master mechanics. Profusely illustrated, easily understood, high-lighted with information on kinds, use and care of files. Foremost book of its kind. *Send for copies for the interested men in your organization.*

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PROVIDENCE 1, R. I., U. S. A.**

(Also Canadian Plant, Port Hope, Ont.)

NICHOLSON FILES

FOR EVERY PURPOSE



"Know-How" Information, Continued

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ON EACH PAGE

16. ROTARY FILES—Each wheel unit of Cardineer rotary file puts 6000 cards within natural reach of operator, and is said to eliminate drudgery and actually cut operations 40% to 60%. Bulletin describes unit in detail. Diebold, Inc.

17. GEAR CHUCK—Eight page bulletin describes Match-It chuck for accurately boring and grinding holes of gears. Construction based on principle that force holding gear should be in same direction as that normally exerted toward mating gears. The chuck is designed to accommodate both helical and spur-toothed gears—either external or internal. It consists of two gripper plates, one stationary, the other movable and the only movable part. Lemaire Tool & Mfg. Co.

18. ABRASIVE MILLING—Catalog on No. 302 Campbell horizontal wet abrasive cutting machine is described as handy reference book for Purchasing men and others. Features of machine clearly described, along with illustrated details of typical job. Andrew C. Campbell Divn., American Chain & Cable Co.

19. METALLIC FLUX—Single page bulletin describes metallic flux which has lower melting temperature than soft silver solder. It is said to overcome disadvantages of many soft soldering compounds, and to cut down warpage and material hardness changes and stresses. Metallizing Co. of America.

20. PLASTIC TUBING—Pipe and Fittings—Illustrated brochure describes Saran polyvinyl chloride thermoplastic which has unusual properties of moisture, chemical and solvent resistance, and high tensile strength and flexural and fatigue strength. Tubing is available in stock sizes from 1/8" O.D. to 3/4" O.D.; pipe in sizes 1/2" to 4". Acadia Synthetic Products Divn. Western Felt Works.

21. PICKLE BATH TONERS—Data sheets describe ACP pickle bath toners, what they are and what they do. Liquid types are used in muriatic acid; powder types are used in sulfuric acid solutions. Toners are claimed to improve the penetration, wetting and spreading action of zinc or ammonium chloride fluxes in pre-

paration for galvanizing, tinning, etc. They are used with or without Rodine. American Chemical Paint Co.

22. HIGH SPEED HAND TOOLS—Booklet describes Precise—35 electric hand tool which operates at 35,000 rpm. With various accessories, it can be used for deburring holes and slots, smoothing corners, finishing grooves and deburring inside tubing. Accessories, mounted wheels and midget milling cutters available are also described. Precise Products Co.

23. PRESSURE GAUGE—Accuracy of Duragage pressure gauge, described in catalog 1279, is assured to within 1/2% of 1% of dial graduation over entire scale on 270° dial arc. Gauge is mounted in strong, non-corrosive plastic case. Standard dials are illustrated, and data on specifications for selection are included. Ashcroft Gauge Divn., Manning, Maxwell & Moore, Inc.

24. RADIUS FORMING TOOLS—Diamond tools which will form radii from .010" to .500", concave or convex are described in illustrated booklet. Accuracy said to be assured because of careful selection of diamonds for particular radius. Specifications and price list included. Wheel Trueing Tool Co.

25. PERSONNEL ADMINISTRATION—Records and Procedure—Complete system for effective personnel management is outlined in 87 page guidebook issued by Remington Rand Inc. Based on use of visual records, tools for this new technique include application form, job record, operating forms, employee's record and history file, cross reference record. Each of these is fully described, illustrated and sample types shown. Check No. 26 on coupon.

26. PRECISION MEASUREMENT—New pocket size handbook presents a variety of measuring instruments including gage blocks, gage instruments and accessories. Tables and data pertaining to gaging methods are included, as are a glossary and questions and answers to serve as test of knowledge for reader. Covers some 24 subjects essential to scientific measurement. How many copies? Continental Machines, Inc.

27. FASTENING DEVICES—Stock record in folder form covers many regular and special items of aviation and commercial fasteners in stock. Purchasing Agents will find this useful in keeping abreast of stock conditions. List includes fasteners in steel, brass, stainless steel and aluminum. Manufacturers Screw Products.

28. ABRASION TESTER—Device for comparing toughness of insulation on film-coated magnet wires is described in single page leaflet. Consisting of anvil, clamp for holding wire sample and scraper head, it is portable, easy to operate, and since it is mechanical, does not depend on operator's judgment. It is known as the repeated-scrape abrasion tester. General Electric Co.

29. STEEL SHOP ACCESSORIES—Shop boxes for small parts on assembly lines, steel foreman's benches, machine tool cabinets, tenders, tool room shelving inserts, sectional shop boxes, and stock carts are described in 8-page folder. Prices and specifications given. Aurora Equipment Co.

30. ACID PROOF CEMENT—Data sheet describes Syntho acid proof cement for mortar for laying chemical brick, pointing old brick linings, and for use as protective coating to resist corrosive acid fumes, vapors and condensates. May be used at temperatures as high as 330 deg. F. Compressive strength 6000 lbs. p.s.i.; tensile strength 1100 lbs. p.s.i. Sets in 1 hour at 70 deg. F. Ready for service in 18 to 24 hours. Cement consists of synthetic resin binder in liquid form and a dry acid proof powder. Electro Chemical Supply and Engineering Co.

31. LUBRICATING DEVICES—172 page catalog. Gits Bros Mfg. Co. catalog No. 60 covers oilers, oil seal and lubricating devices. Unusually complete and illustrates hundreds of lubricating units and fittings for all types of equipment.

32. INDUSTRIAL RUBBER PRODUCTS—Folder featuring products for mining industry includes conveyor belts, transmission belts, trolley wire guard, various types of hose, friction material, etc. Folder is described as invaluable aid to persons looking for efficient and post-war mechanical rubber products. Manhattan Rubber Mfg. Divn., Raybestos-Manhattan, Inc.

33. MAGNETIC POLISHING LATHE—Eight-page bulletin explains principle and method of operation of these units and is illustrated to show method of application of the magnetic chuck. Several types of face plate applications for holding work to be polished, burred or lapped, are shown. Lima Electric Motor Co.

34. RESIN-BONDED PLYWOODS—New process for molding which enlarges field for bonding of wood laminates of flat, compound and spherical shapes, is described in special article in Bakelite Review, which also contains data on thin vinyl plastic film for coatings and packaging, and articles on Low-pressure Molding of Laminates. Bakelite Corp.

(Continued on page 14)

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4-44

Four pages of "Know How" — 10-12-14-16

WHEN THE ALL CLEAR SOUNDS
YOU'LL
Save Months
IN RECONVERSION
WITH
Walker-Turner
MACHINE TOOLS



(Radial Drill)
Typical example of Walker-Turner versatility is this Radial Drill. Drills to the center of a 62" circle. Spindle speed range, 160 to 8200 R.P.M. Head tilts 45° in either direction.

These streamlined units deserve a place in your reconversion — because they're flexible, rugged, simple, safe, easy to operate, and offer a wide range of speeds for cutting practically any material. On the "costs" side, Walker-Turner Machine Tools show

marked savings in power consumption, capital investment and operating expenditures. And fast delivery . . . to help you avoid reconversion delays . . . will be another Walker-Turner feature.

WALKER-TURNER COMPANY, Inc., Plainfield, N. J.



(20" Drill Press)
Automatic power feed is a feature of the newest Walker-Turner 20" Drill Press.



(Metal Cut-off Machine)
"Kick" cutting with a Walker-Turner Radial Cut-off machine.



(Band Saw)
Cutting a special profile in plastics with a Walker-Turner Band Saw.

101

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turner**
COMPANY, Inc.
PLAINFIELD, N.J.
U.S.A.

MACHINE TOOLS

DRILL PRESSES — HAND AND POWER FEED • RADIAL DRILLS
METAL-CUTTING BAND SAWS • POLISHING LATHES • FLEXIBLE SHAFT MACHINES
RADIAL CUT-OFF MACHINES FOR METAL • MOTORS • BELT & DISC SURFACERS

"Know-How" Information, Continued

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☐ **35. MATERIALS HANDLING MACHINERY**—Conveyors, bridges, tipples, cableways, crushers, grab buckets, screens, car dumpers, ship unloaders, stackers, towers, bucket elevators and wide assortment of accessory equipment are covered by brochure which shows operations and products of Robins Conveyors Inc.

☐ **36. FELTS**—Samples and specifications. Card-folder contains 31 samples of mechanical felts made according to S.A.E. specifications, felts for general use, and Saran rubber sheets and molded parts. Special treatments supplied for flame-proofing, water-proofing, moth-proofing and other special characteristics. Western Felt Works.

☐ **37. CLUTCH HEAD SCREWS**—Catalog describes new clutch head screw available in wide variety of recessed heads. "User gets power, easy entry and strength never before combined in a screw head. Ideal for hard-to-get-at places. Exceptionally effective with thread-forming screws and power or spiral drivers. Designed and built around ordinary screw driver. Can be removed or tightened with driver at an angle of 45°. United Screw & Bolt Corp.

☐ **38. FACE PROTECTORS**—Catalog presents a variety of safeguards for face and eyes which include helmets, lens and lens shields, hand shields, goggles and respirators. Sellstrom Mfg. Co.

☐ **39. PUMP MANUAL**—Cool and Lubricating. New 88-page manual tells how to determine size of pumps, and describes and illustrates all of the pump models made by the company, many being photographed in operation. Company makes two types—the impeller type and the positive-displacement type, in some 400 standard sizes. Pioneer Pump & Mfg. Co.

☐ **40. SLIDE RULE** for Circuit Breakers—Free slide rule offers simplified means for determining the correct size air circuit breakers for all industrial substation applications. With this rule anyone can easily calculate the interrupting capacity of the 600-volt class air circuit breakers needed for control of power in industrial plants. It can be used to check breakers on any system. It applies to direct con-

nected as well as cascaded breakers. Allis-Chalmers Mfg. Co.

☐ **41. CARBIDE TOOLS**—Four page bulletin 44-1 covers six styles of single-point tools, four of which are available in left and right hand types, including offset tools. Specifications and prices listed. Tungsten Carbide Tool Co.

☐ **42. V BELT DRIVES**—New 44-page bulletin describes Allis-Chalmers complete line of fractional horsepower Texrope V-Belts and Sheaves. Book includes working formulas from which correctly-engineered fractional horsepower drives can easily be derived. Bulletin should be of especial interest to manufacturers and operators of light duty power tools, fans, blowers, pumps, stokers, oil burners, processing equipment, etc. Check No. 42 for copy of bulletin B-6249.

☐ **43. CALCULATING CHAIN DRIVE CENTERS**—Series of tables aids calculation of center distances and chain lengths of chain drives. Body of table gives exact center distances for chain of 1" pitch and of length listed in pitches in first column. Method used is said to give accurate results. Link-Belt Co.

☐ **44. BUSWAYS & WIREWAYS** — 36-page bulletin describes four different types of ducts for electrical distribution systems—plug in, feeder, square and screw cover. Specific applications of each, diagrams and illustrations are covered and price lists given. Square D. Co.

☐ **45. INDUSTRIAL LIQUIDS**, Handling and Control. Catalog covers equipment for Filtration and Distillation, Lubrication, Metering, Pumping, Refueling Systems, Storage and Dispensing, and Miscellaneous equipment such as barrel draining devices, centrifugal filters, fill boxes, float suction and hose nozzles. S. F. Bowser & Co.

☐ **46. HYDRAULIC PULLER**—Bulletin 43J describes Simplex Jenny center hole hydraulic puller which pulls, pushes or lifts and can be rigged up as a portable press. Self-contained unit can operate vertically or horizontally and without side thrust or friction. Five models illustrated. Templeton-Kenly Co.

☐ **47. REAMERS—BORING BARS**—New Catalog No. 44 describes Wetmore reamers and boring bars. Gives full details on standard tools and many special applications. Inserted blade construction is said to make for important savings in production costs. Page of instructions shows how to expedite shipment and avoid delays. Wetmore Reamer Co.

☐ **48. DIAMOND DRILL BITS**—Booklet of 12 pages, well illustrated, describes Truco diamond drill bits,—coring, blasting, pilot, and casing and reaming shells. Wheel Trueing Tool Co.

☐ **49. JACKS**—Buda jacks are illustrated and described in 32-page booklet—models and sizes for all lifting jobs. Chart shows how to select the correct jack. Types include automatic lowering—general purpose, pole pulling, cable reel, ratchet, screw jacks, push and pull, hydraulic types and others. The Buda Co.

☐ **50. ELECTRIC SANDER**—New electric, portable sander of the oscillating type that is said to meet every requirement for heavy production demands, is described in four-page bulletin. It is styled the Steerling 1000. Motor, G.E. 1/5 h.p., universal current, 110 V. Dimensions overall: 8" long, 4 1/4" wide, 7 1/4" high. Sterling Tool Products Co.

☐ **51. WIREBOUND BOXES & CRATES**—Illustrated charts give instructions on assembling and closing all types of General wire bound boxes and crates. It is said to be of especial help to newcomers. Portfolio for the asking. Get one for your shipping room. General Box Co.

☐ **52. ACID-PROOF BRICK and Tile** — Descriptive folder describes Duro acid-proof brick and tile, in detail. Gives full information as to standard sizes and shapes, and also illustrates special shapes available. Electro Chemical Supply & Engineering Co.

☐ **53. ZINC SURFACE TREATMENT** — Mimeograph release describes Alronox Process (Oxidine Z) for blackening and protecting zinc surfaces. Describes equipment, preparation of solutions, control and coloring procedure. Alrose Chemical Co.

☐ **54. NEUTRAL BATHS** for Hardening & Tempering.—New Neutral Bath Folder of 28 pages tells about advantages of neutral baths, and details various processes, control, and tempering baths. A. F. Holden Co.

☐ **55. DRESSING ABRASIVE WHEELS**—New Bulletin describes latest model J. & S. radii and angle dresser, model "E," and describes Fluid-motion form dressing with "one setting and using one handle" which is said to assure "angles tangent to radius perfectly blended in one continuous fluid-motion." J. S. Tool Co.

☐ **56. SOCIAL SECURITY** — Interesting calculator indicates monthly benefits based on wage rates and years of service for worker at 65, worker and wife at 65, widow at 65, widow and 1 child and widow and two children, and gives other (Continued on page 16)

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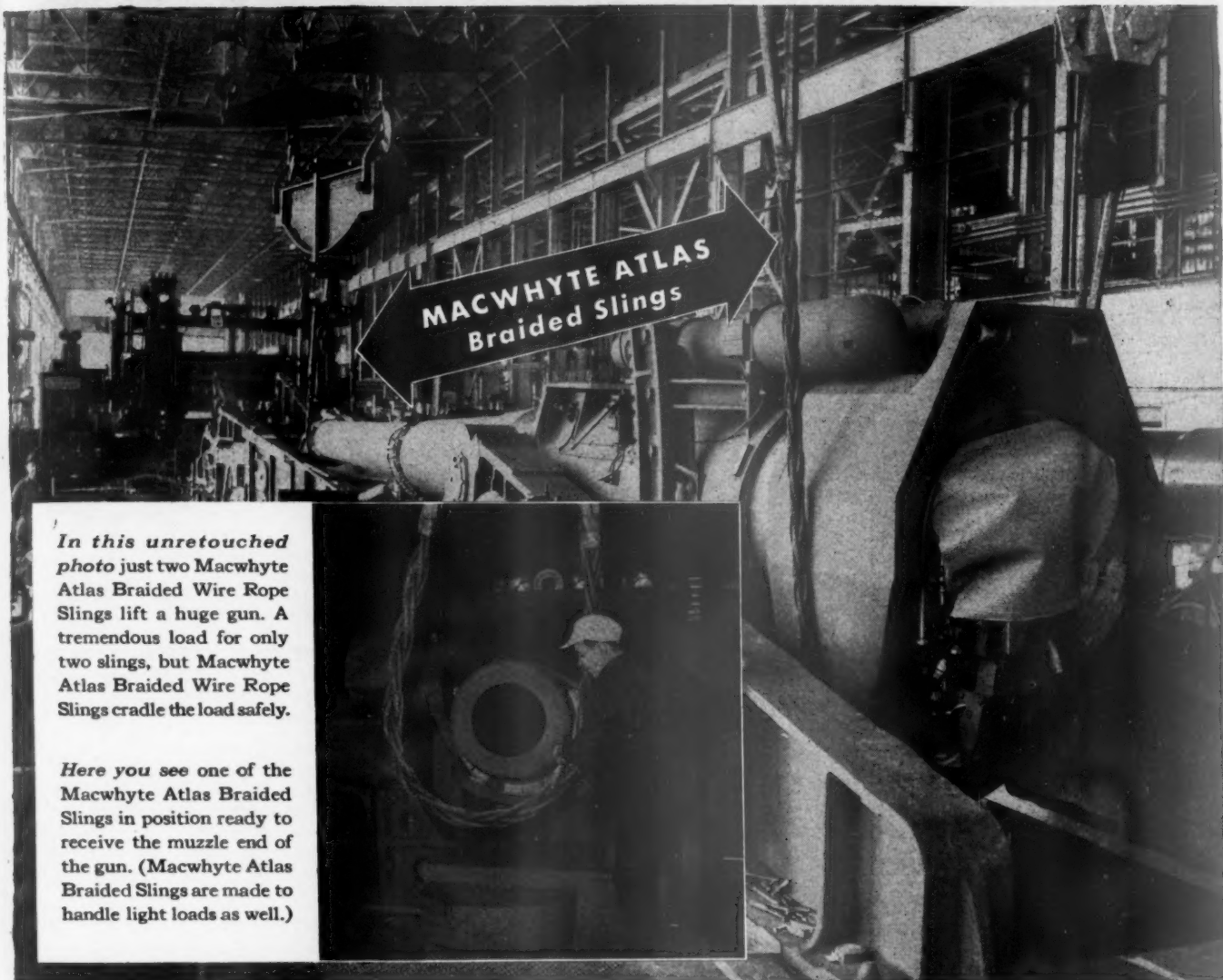
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4-41

Four pages of "Know How" — 10-12-14-16



In this unretouched photo just two Macwhyte Atlas Braided Wire Rope Slings lift a huge gun. A tremendous load for only two slings, but Macwhyte Atlas Braided Wire Rope Slings cradle the load safely.

Here you see one of the Macwhyte Atlas Braided Slings in position ready to receive the muzzle end of the gun. (Macwhyte Atlas Braided Slings are made to handle light loads as well.)

SPEED YOUR PRODUCTION SAFELY

With Macwhyte Slings

"For safe materials handling with cranes and hoists, Macwhyte Wire Rope Slings are unequalled," say manufacturers.

Safe handling with Macwhyte Slings "steps up" production, cuts down costs, reduces waste and improves material's handling rigging methods.

Today the demands of manufacturers plus military and naval requirements far exceed peacetime requirements. It pays to plan your rigging well in advance of your needs.

Our Pledge to you is: We will continually produce to

the utmost of our ability without the sacrifice of quality. We will study your handling needs with you and plan the design on which the best delivery can be made.

★ Let's ALL back the attack—buy ANOTHER War Bond! ★



Member National
Safety Council



MACWHYTE COMPANY

2918 FOURTEENTH AVENUE, KENOSHA, WISCONSIN

Manufacturers of the correct wire rope for your equipment

Left-&-Right Lay Braided Slings • Aircraft Tie-Rods
Aircraft Cable • "Safe-Lock" Swaged Terminals

Mill Depots: New York • Pittsburgh • Chicago • Ft. Worth • Portland
Seattle • San Francisco • Distributors throughout the U.S.A.



When larger cranes are built, Macwhyte ATLAS Braided Wire Rope Slings will be made to meet their capacity

"Know-How" Information, Continued

USE COUPON
ON EACH PAGE

Information as to benefits. Manufacturers Screw Products.

57. NONFERROUS & WOOD WORKING MACHINES — New catalog of 44 pages describes Onsrud line of routers, grinders, shapers, contour milling machines, scarfing machines, copy lathes, portable tools, cutters and cutter grinders. Illustrations show installations in aircraft and woodworking plants. Onsrud Machine Works, Inc.

58. TWO CARBON STEELS — New catalog No. 1243, 32 pages, pictorially and textually describes Speed Case and Speed Treat carbon steels. Former is a low carbon, open hearth free machining steel, and latter is medium carbon, open hearth high tensile free machining steel. Physical characteristics are details, and good illustrations portray uses. W. J. Holliday & Co.

59. FULLERS EARTH — Florigel, hydrated Florida fullers earth, is described in data sheet; grayish-white in color; specific gravity 2.30 to 2.60; pH 7.9 to 8.5. Comes in two grades, Floridin and Florex. Sheet gives detail of typical analysis. Floridin Co.

60. CHUCKS — DoAll electro-magnetic chuck, and the Selectron, a current rectifying, demagnetizing and power varying unit, are covered by new 4-page bulletin which shows how Selectron and electronic device furnishes D.C. power, giving operator control over magnetic pull from chuck and demagnetizes chuck. Continental Machines.

61. ALL-IN-ONE Fastener Unit — Folder #101 contains complete information for Purchasing Agents and others on Eaton Springtite Semblies, —preassembled lock washer on quality screw or bolt, that can't come off. Available in all sizes and head types. Eaton Mfg. Co., Reliance Div.

62. FINISHING ABRASIVES — Something New. Bulletin describes Brightboy for polishing, pre-polishing and finishing metals. Abrasive is cushioned in elastic rubber compound in which it is impregnated. Available in wheels, tablets and sticks. Weldon Roberts Rubber Co.

63. BOOMS & DEPRESSIONS since 1775 — P.A.s will find chart delineating booms and depressions from George Washington's time to date in Vol. 19, Ex-Cell-O Tool Tips, of unusual interest. It also indicates ratio of business activity following previous wars, and gives data on national income, price inflation, Federal debt and business activity. Ex-Cell-O Corp.

64. UNIT HEATERS — Three new additions to A.I.A. file on unit heaters are announced by Carrier Corp. File 30-C-43 covers vertical discharge, 46S 5-way (all four sides and downward) heater, file 30-C-43, 46E horizontal discharge unit heater and, file 30-C-45, blower type heat diffusers for heating and ventilating large areas.

65. FLEXIBLE SHAFT Machines — Portable. Catalog 45, 40 pages, describes direct drive and multi-speed countershaft drive machines in four mountings, machines for die and mold shops, light duty machines, sanding and polishing machines, heavy duty machines, special machines, and attachments and accessories. R. G. Haskins Co.

66. QUICK-DETACHABLE SHEAVES for Multiple V-Belt drives are detailed in 12-page bulletin. They are said to save time, labor and money. Bulletin also contains data on stock Q-D hubs, standardized dimensions, interchangeable hub and rim combinations, and cast iron Q-D sheaves, standardized dimensions. Pyott Foundry & Machine Co.

67. ROTARY FILE — Cardineer for filing, posting and reference work is described in bulletin entitled "Timely Aids for Faster Record Processing." Compact Cardineer houses 6000 records in area of less than four square feet. Recommended for Purchasing Department detail. Diebold, Inc.

68. 1-HOUR FINISHES — Colorcard describes Hardcote finishes which are said to dry hard in one hour, and to set out of dust in 15 minutes. Cover in one coat. May be applied by brush or spray. Finish is said to be resistant to alcohol, acids, alkalis, sun, rain and snow. Finishes

have plastic base. Available in wide variety of colors. McDougall-Butler Co., Inc.

69. TOOL STEEL, WATER-HARDENING — Small bulletin describes Jessop R.T.S. Water-Hardening tool steel for applications where toughness is required above all other qualities. R.T.S. is said to have enough ductility, with high hardness and strength, that it will show more than 5% elongation before it will break. Jessop Steel Co.

70. SYNCHRONOUS MOTORS and control for compressor drives are featured in new 4-page bulletin (GEA 4139), issued by General Electric Company. Bulletin is well illustrated.

71. VENTILATING EQUIPMENT — Propellair 72-page catalog No. 10 describes and pictures the complete Propellair line of ventilating equipment, and shows how to solve problems involving heat, moisture, dust or fumes. Propellair, Inc.

72. WELDING CRANES — A two-page, illustrated bulletin, Unit 68, describes special automatic welding cranes developed by engineers of the Whiting Corporation.

73. INPLANT FEEDING — Series of bulletins and circulars describes hot food carriers and hot soup and coffee carriers. Relieve cafeteria congestion, and make it possible to serve complete hot meals to workers through outside caterers with no kitchen or cooking operations in the plant. Vacuum Can Co.

74. HYTEMP PROTECTIVE COATING — For protection against extreme high temperatures, acids, hot fumes, etc., rust and corrosion; as a resist against spatter of welding or flow of brazing material and flux beyond the joint; or, in selective hardening. Resists temperature up to 3500 deg. F. Applied by brush, spray or dipping. Fully described in circulars. Geo. R. Mowat Co.

75. STEAM PLANT EQUIPMENT — Blow-off valves, water columns and gages, expansion joints, steam traps & strainers, spray nozzles and liquid level indicators are described in Yarnall-Waring Co.

76. ROLLER LEVELER for sheet metal — New bulletin describes Voss roller leveler for leveling armor, plate, sheet, and strip — any metal that can be rolled. Descriptions are accompanied by illustrations. Voss Machinery Co.

77. AGITATORS — Air motored agitators which operate by compressed air and are safe for use on the most flammable materials are described in generously illustrated catalog of 24 pages, which shows the scope of the applications. They are trademarked Pneumix. Eclipse Air Brush Co., Inc.

78. FACTORY TRUCKS & TRAILERS — Six-page section of industrial handling equipment catalog, describes new automatic dump hopper on casters, 4 models of heavy duty (wagon type) trucks, 16 models of steel boxes, baskets and platform skids, trucks, trailers, and four models of specific purpose trucks. H. L. Pitcher Co.

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4-44

Four pages of "Know How" — 10-12-14-16

You get all these Great Features in **SKILSAW DRILLS!**

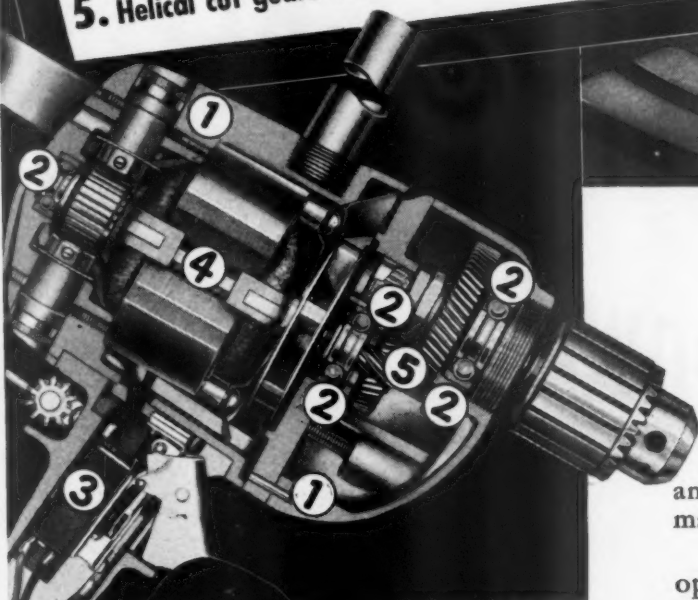
1. Die cast aluminum bodies for lighter weight, greater strength!
2. 100% anti-friction bearing construction eliminates vibration!
3. 100% overload capacity switch for trouble-free operation.
4. Extra capacity motor for fastest drilling, longest life.
5. Helical cut gears of finest steel for quiet, smooth operation.



• Model "80" SKILDRILL—
the lightest, most compact
 $\frac{1}{2}$ in. electric drill made.
Weighs only 8 lbs., overall
length 11 $\frac{1}{2}$ inches. Pipe
handle is detachable.



• Model "45" SKILDRILL—
capacity $\frac{1}{4}$ in. in steel, $\frac{1}{2}$ in. in
wood. Weighs only 2 $\frac{3}{4}$ lbs. Fits
the palm of your hand easily.



It's no wonder SKILSAW DRILLS are preferred in all industry... *they stand the gaff!* They've got the extra power that means top load speed on all drilling, boring and reaming jobs. They've got the *perfect* balance and compactness that means easier handling in any position. They give you greater output per man with less effort!

And SKILSAW DRILLS cost less to operate because they're *quality-built throughout* to stand up under today's round-the-clock production schedules!

Purchasing Agents have fewer headaches when they buy SKILSAW DRILLS. Your distributor can supply you. Ask him to demonstrate to you why SKILSAW DRILLS are your *best buy!*

SKILSAW, INC.

4761 Winnemac Ave., Chicago 30, Ill.

Sales and Service Branches in All
Principal Cities



PLANNING FOR AFTER-THE-WAR?

Let Skilsaw Field Engineers help you now to plan "tooling-up" for peacetime production with Skilsaw's new post-war tools.

SKILSAW TOOLS

MAKE AMERICA'S HANDS MORE PRODUCTIVE 



• Model "64" SKILDRILL—
 $\frac{1}{2}$ in. heavy duty drill with
100% anti-friction bearing
construction. Perfect for
close-quarter drilling... pipe
handle is detachable.

ALL FROM ONE

L-B

SPEED REDUCERS

Worm Gear
Herringbone Gear
Motorized Helical Gear

VARIABLE SPEED CHANGERS

P.I.V. Gear
Variable Roller Drive
(Motorized & Gear Set Types)

SILVERSTREAK SILENT CHAIN DRIVES

SILVERLINK ROLLER CHAIN DRIVES
ROLLER & BALL BEARINGS
BALL & ROLLER BEARING PILLOW BLOCKS
All Types

BALL & ROLLER BEARING UNITS
Duplex, Flange, Cartridge, etc.

BABBITTED BEARING UNITS

All Types
Flange, Step, Post, etc.

COUPLINGS

Rigid & Flexible

CLUTCHES & COUPLINGS

Jaw & Friction

BASE PLATES

Plain & Adjustable

SHAFT COLLARS

Solid & Split

TAKEUPS

All Types

HANGERS

Cast Iron & Pressed Steel

SPROCKETS

Cut & Cast Tooth

GEARS

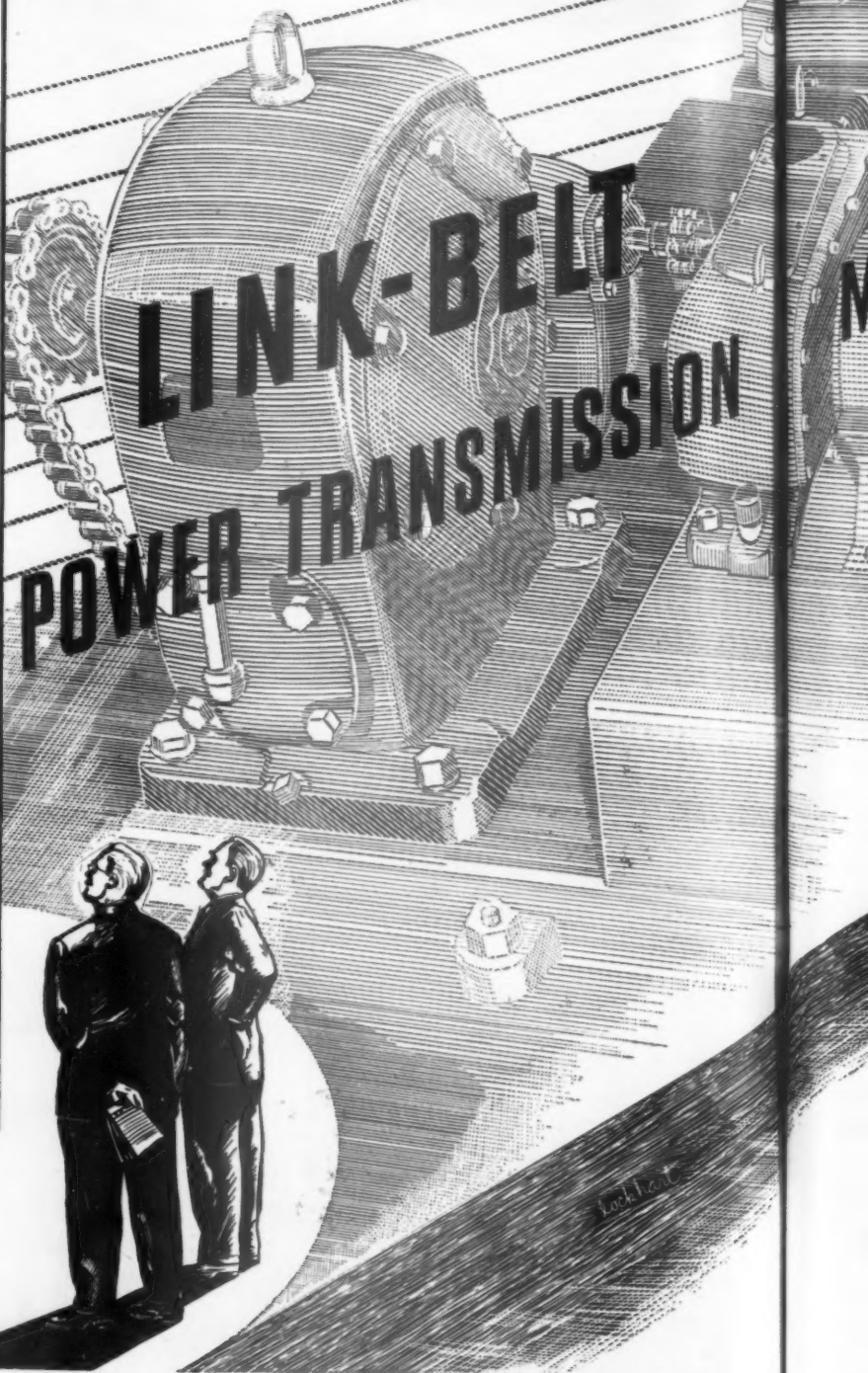
Cut & Cast

PULLEYS

All Types

SHAFTING

Machined to order





SOURCE

MACHINERY



COMPLETE SERVICE ASSURES THE CORRECT EQUIPMENT FOR EACH APPLICATION!

When it has to do with power transmission you have only one name to remember —one source to call—one responsibility to rely upon—one high standard of performance to expect. Link-Belt Company, as designers and builders of practically every type of power transmission machinery, are in a position to recommend and supply the size and type of equipment best suited to the requirements of a given situation. There is a Link-Belt office, factory branch or distributor in your vicinity — as close as your telephone . . . as ready to serve. Send for catalogs.

LINK-BELT COMPANY

CHICAGO 9 • INDIANAPOLIS 6 • PHILADELPHIA 40 • ATLANTA • DALLAS 1
MINNEAPOLIS 5 • SAN FRANCISCO 24 • TORONTO 8

Offices, factory branches and distributors in principal cities



Chicago Plants



Indianapolis Plant



Ordnance Plant

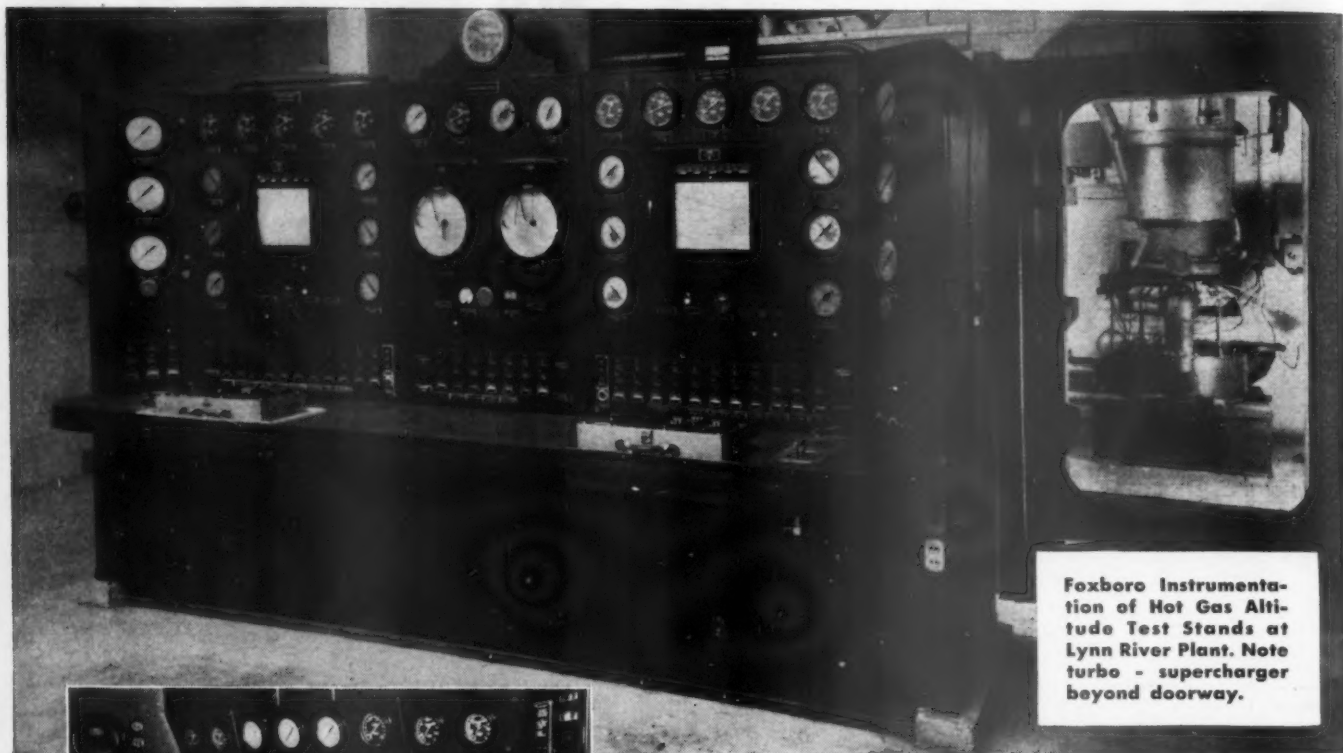
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LINK-BELT

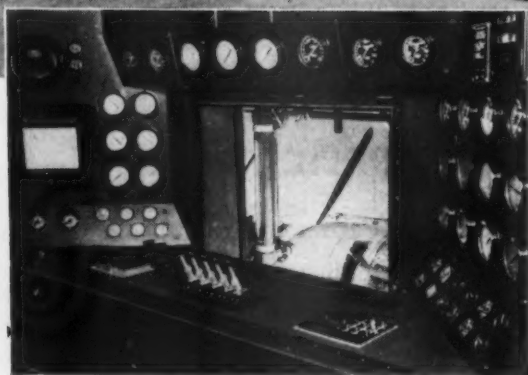
**Builders of the most complete line of
POWER TRANSMISSION MACHINERY**

FOR PRECISION

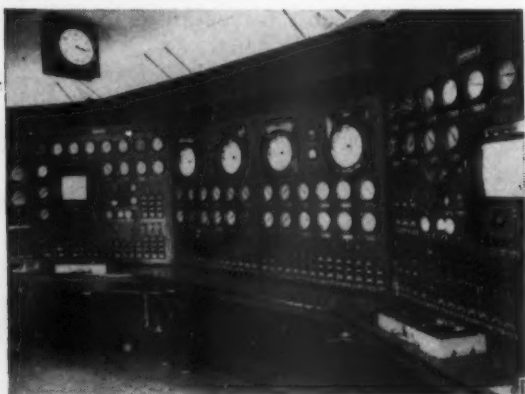
in Turbo-Supercharger Testing...



Foxboro Instrumentation of Hot Gas Altitude Test Stands at Lynn River Plant. Note turbo - supercharger beyond doorway.



Control board for Airplane Power Plant . . . one of 7 Foxboro-equipped test cells at General Electric's Lynn Plant.



Hot Gas Altitude and Refrigeration Control Board completely equipped with Foxboro Dial Indicators, Potentiometer Recorders and Stabilizer Controllers.

Foxboro Instruments equip test-stands at General Electric Co.!

For the important job of designing and improving airplane turbo-superchargers, seven altitude test-cells have been set up at the Lynn River Plant of General Electric Company. To insure utmost precision in measuring and controlling atmospheric conditions that duplicate those at 50,000 ft., and down to -100°F. , these cells are fully-equipped with Foxboro Instruments.

This is but another example of modern engineers' preference for Foxboro in close control jobs. The majority of today's airplane engine builders also use Foxboro Instruments on their test stands.

In your process instrumentation, too, Foxboro's experience can help you obtain best results. Write your problems to The Foxboro Company, 178 Neponset Avenue, Foxboro, Mass., U.S.A. Branches in principal cities.

FOXBORO
REG. U. S. PAT. OFF.
Instruments



REDESIGNED FOR UNIFIED APPEARANCE

OF BALLAST AND NEW FLUORESCENT FIXTURES

STREAMLINED
to better fit the contours of your fixture

PAINTED GRAY
to match the finish of most fixtures

LEADS OUT THE BOTTOM
for easy installation on narrow wiring channels

HERE'S a ballast that is *made for* external mounting. Its streamline, drawn-steel case, dark-gray finish, and "bottom leads" give the ballast and fixture a *unified* appearance.

Electrically, this ballast is exactly the same as our standard design—the same high quality and dependability. As it can be mounted completely exposed, it operates in lower ambient temperatures—which contributes to long ballast life. Special installation features such as ventilating louvers and conduction plates are not required.

This ballast is available in Tulamp 40-watt ratings, for circuits of 118, 208, 236, and 260 volts.

FOR MORE INFORMATION about this improved design, and for details on our complete line of single-lamp, Tulamp, three-lamp, and Forlamp ballasts, send for our newly revised catalog, GEA-3293. *General Electric Company, Schenectady, N. Y.*

GENERAL  ELECTRIC

408-21-5906



**BALLASTS FOR
FLUORESCENT
LIGHTING**

Certified by ETL
Listed as approved by
Underwriters' Laboratories, Inc.



Every week 192,000 G-E employees
purchase more than a million dollars'
worth of War Bonds.

Surfacing WITH Discs

IN airplane production for Victory there are countless grinding operations where Norton Grinding Wheels contribute to the speed so vital now.

Here is one of them.

Norton Discs are available in all sizes and types of mountings necessary for grinding airplane parts—in vitrified, resinoid, shellac and silicate bonds—in Alundum abrasive for steel and malleable iron—in Crystolon abrasive for aluminum castings, brass, bronze and gray iron.

NORTON COMPANY, Worcester 6, Mass.

Behr-Manning, Troy, N. Y., is a Norton Division

*Photo Courtesy,
Douglas Aircraft Company, Inc.*

AIRCRAFT
Norton
GRINDING



NORTON ABRASIVES





THAT BOY, *your* boy, maybe! — in fox hole, or plane, or pig-boat — what does he figure it's all about? What is he fighting for, anyhow?

If you asked him he'd probably look a bit bewildered . . . fighters don't think in terms of "what's in this for me?"

But if you mentioned home-made apple pie, or the nine o'clock show at the Colonial with his girl friend, or the gang harmonizing down at the corner, he'd grin — and understand. That's what he's

fighting for. That's what he wants to come back to.

Will he? — it's up to us. Because the one thing that can kill those dreams of his deader and quicker than anything else is the dizzy, upward-whirling spiral of rising wages, costs and prices that we call *inflation* . . . and you and I are the only ones who can lick it. Here's how:

1. Buy only what you need. 2. Pay no more than ceiling prices.
3. Support higher taxes. 4. Pay off old debts and avoid making

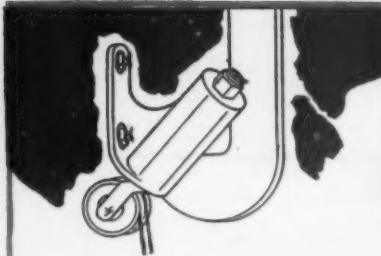
new ones. 5. Don't ask more money for goods you sell or work you do. 6. Provide for the future with life insurance and savings. 7. Buy all the War Bonds you can afford, and *hold* them.

If you do these things — *all of them* — you will be doing your share to hold prices down . . . and you'll be fixing it so that boy up there will come back to a country where he and you can work and live — *happily*.

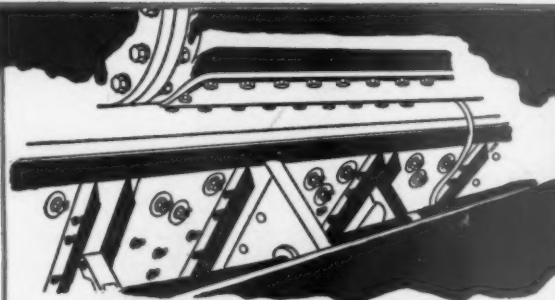
At present our entire effort is directed to the production of war goods of molded rubber. When peace comes we plan the production of many articles (Acushnet Golf Balls among them, of course) for the comfort and the convenience of the American public . . . **ACUSHNET** Process Company, New Bedford, Mass.

**KEEP
PRICES
DOWN**

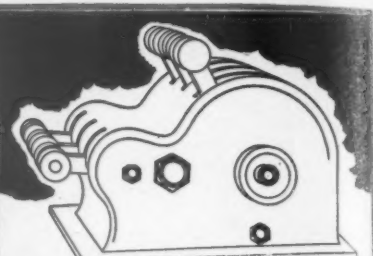
*use it up
wear it out
make it do
or do without*



THROTTLE EQUALIZER MECHANISM fastened with Elastic Stop Nuts keeps throttle settings the same, even when the hull is distorted by heavy seas.



ENGINE BEDS. PT boats are a blasting mass of power. Besides, stresses and strains make the hulls weave. So, to hold the engines tight and secure against vibration and other forces, they are fastened down with Elastic Stop Nuts.



ENGINE ROOM SIGNALS and engine controls center in this unit held firm and secure with Elastic Stop Nuts.



Courtesy of Higgins Industries

GRIPPING TIGHT ON THE BATTLING COCKLESHELLS

They're swift. They're light. They're crammed with 4,000 throbbing horsepower that drives them, fighting like demons, through giant seas at breakneck pace.

Naturally they take an awful beating.

Under such shock and vibration only the surest fastenings will hold. That's why throughout Higgins Boats you'll see the famous red collar that marks Elastic Stop Nuts.

These nuts hold fast in the face of the worst vibration. This is accomplished by the elastic collar built in the head of the nut. This collar

grips the bolt — presses itself between the bolt threads and holds tight. The nut can't wiggle. It can't turn. It can't shake loose.

These nuts will work wonders in peacetime uses. They'll make products safer, stronger and longer-lasting. They'll keep production equipment working with fewer inspections, take-ups and replacements.

Get the facts from our engineers. They'll gladly tell you about Elastic Stop Nuts and sit down with you to help work out any fastening problem you have.

ELASTIC STOP NUT CORPORATION

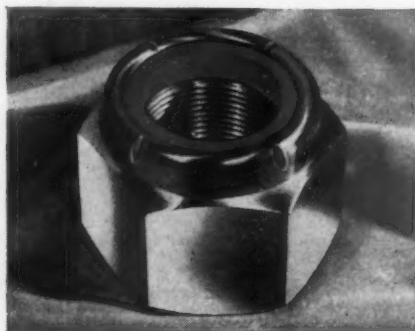
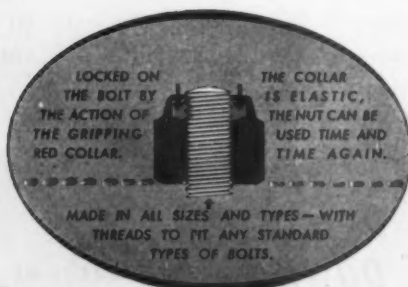
Gentlemen:

Torpedo boats must be built to stand terrific punishment — not only from heavy seas, but from vibration of engines, machine guns and depth charges. Precious time in maintenance and a greater sense of security are gained by the use of Elastic Stop Nuts at all vital points. Weight is also at a premium in PT's as in aircraft and prohibits the use of more cumbersome and less positive locking methods.

Yours very truly,

Jed Spurgeon

PROJECT ENGINEER, HIGGINS INDUSTRIES, INC.



ESNA
TRADE MARK OF
ELASTIC STOP NUT CORPORATION OF AMERICA

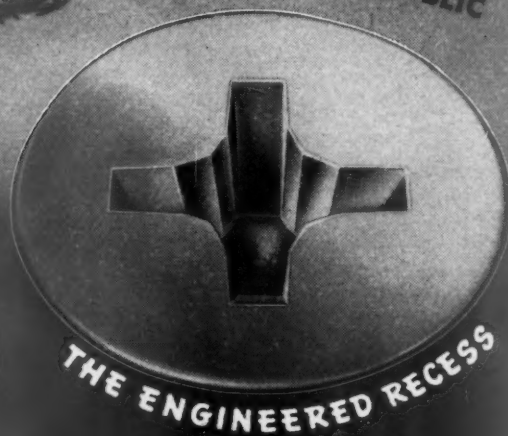
ELASTIC STOP NUTS

Lock fast to make things last
UNION, NEW JERSEY AND LINCOLN, NEBRASKA

Which RECESSED HEAD SCREW DOES THE AVIATION INDUSTRY *Okay?*



IT'S PHILLIPS



IT'S GOT TO BE RIGHT! The aviation industry knows its engineering... knows the answers to production efficiency. That's why most of the leaders in this industry selected the PHILLIPS Recessed Head.

You'll choose the Phillips Recess, too, once you study its exclusive design. You'll appreciate the scientific engineering that makes it so successful. You'll discover

that every angle, every dimension has a purpose — is important to screw driving efficiency and screw strength. You'll agree there's nothing like it!

To end the screw driving troubles that slow down production and shove up assembly costs, specify screws with the Phillips Recessed Head. You can get them in any head style, type or size.

TO MAKE WARTIME QUOTAS AND PEACETIME PROFITS

FASTER STARTING: Driver point automatically centers in the Phillips Recess... fits snugly. Fumbling, wobbly starts, slant driving are eliminated. Work is made trouble-proof for green hands.

FASTER DRIVING: Spiral and power driving are made practical. Driver won't slip from recess to spoil material or injure worker. (Average time saving is 50%.)

EASIER DRIVING: Turning power is fully utilized. Workers maintain speed without tiring.

BETTER FASTENING: Screws are set-up uniformly tight, without burring or breaking of screw heads. The job is stronger, and the ornamental recess adds to appearance.



PHILLIPS *Recessed Head* SCREWS

WOOD SCREWS • MACHINE SCREWS • SELF-TAPPING SCREWS • STOVE BOLTS



IDENTIFY IT!

Center corners of Phillips Recess are rounded...
NOT square.

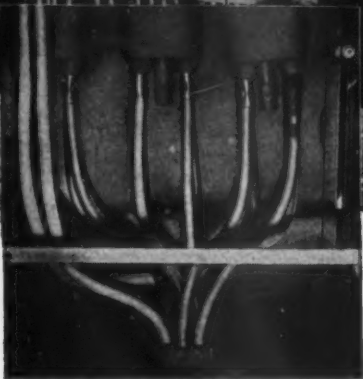
Bottom of Phillips Recess is nearly flat...
NOT tapered to a sharp point.

23 SOURCES

American Screw Co., Providence, R. I.
The Bristol Co., Waterbury, Conn.
Central Screw Co., Chicago, Ill.
Chandler Products Corp., Cleveland, Ohio
Continental Screw Co., New Bedford, Mass.
The Corbin Screw Corp., New Britain, Conn.
General Screw Mfg. Co., Chicago, Ill.
The H. M. Harper Co., Chicago, Ill.

International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
Milford Rivet and Machine Co., Milford, Conn.
The National Screw & Mfg. Co., Cleveland, Ohio
New England Screw Co., Keene, N. H.
The Charles Parker Co., Meriden, Conn.
Parker-Kalon Corp., New York, N. Y.
Pawtucket Screw Co., Pawtucket, R. I.

Phost Manufacturing Co., Chicago, Ill.
Reading Screw Co., Norristown, Pa.
Russell Burdell & Ward Bolt & Nut Co., Port Chester, N. Y.
Seavill Manufacturing Co., Waterville, Conn.
Shakeruff Inc., Chicago, Ill.
The Southington Hardware Mfg. Co., Southington, Conn.
Whitney Screw Corp., Nashua, N. H.



Low side of 4150-volt distribution transformer, showing connections of one of the three 208-volt ring mains in the Bell Telephone Laboratory cellar. The 4/0 Okolite-Okoprene cables are connected to the crab joint with mechanical squeeze connectors.

ENGINEERED TO LAST FOR 99 YEARS

When Bell Telephone Laboratories decided to decentralize part of their engineering facilities by moving into the country, they determined that their new buildings would be built to last "for at least 99 years."

Taking advantage of their own extensive laboratory experience and test results, they wrote specifications that they knew would provide the most durable materials and equipment available.

Their wiring specifications, for instance, called for an oil-base compound protected with a neoprene sheath, where exposures required it. In this new laboratory it was essential

to have insulated wire that would resist flame, moisture, heat and chemicals.

The accompanying illustrations show how Okolite-Okoprene cables fitted into the picture and how simple it was to install and splice this carefully-chosen wiring. Okolite-Okoprene cables are used in many other places — in central stations, on railroads, in industrial plants, mines, or wherever long-life and full protection is required — and they cost no more than high quality braided wire. Bulletin OK-2009 describes them in detail. . . . The Okonite Company, Passaic, N. J.



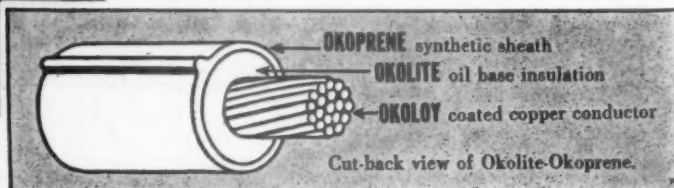
3' x 5' Distribution manhole in Bell Telephone Laboratory cellar where splicer is making final tap with special split tee-connector. Okolite-Okoprene cables were specified for use in the following tough, damp locations: (1) under cellar floors, (2) between buildings, (3) to street lighting standards, (4) at substation, (5) all wiring in kitchen refrigerators, (6) all wiring to outdoor bracket fixtures.

Cooperating on this project were:

Architects and Engineers:
Voorhees, Walker, Foley & Smith, New York
Electrical Contractor:
Hatzel & Buehler, Inc., New York City
Distribution and Power Cables:
The Okonite Company, Passaic, New Jersey

3415

OKONITE INSULATED WIRES & CABLES





It's a long jump from fishing lures to landing craft. Such are the versatile uses of metals from Western. Supplied in sheet or strip, drawn or stamped parts, Western metals are now used in vital parts of war equipment that floats—flies—rolls—shoots. Looking ahead to peacetime business, our engineers and metal experts welcome inquiries from designers and engineers working on post-war products. Our mills are located at East Alton, Ill., and New Haven, Conn.



Western **BRASS MILLS**

Division of WESTERN CARTRIDGE COMPANY, East Alton, Ill.

BRASS • BRONZE • PHOSPHOR BRONZE • NICKEL SILVER • COPPER

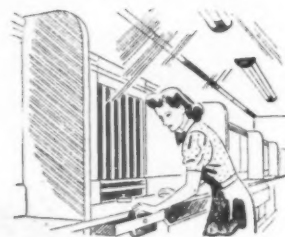
130,000 REASONS



From better See-ability for war work will come higher levels of lighting for everyone—greater efficiency for business and industry, better living for American homes. As soon as materials and manufacturing facilities are avail-



able, Westinghouse will lead the way in such lighting developments as: (1) Long thin fluorescent lamps in new shapes and sizes, for store display and feature lighting. (2) A brighter kitchen for lighter work—supplementary light for

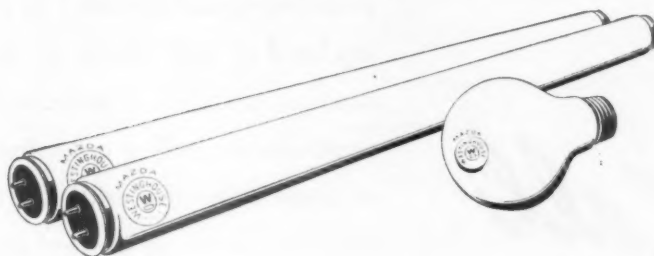


the sink, inside dark cupboards, over work surfaces. (3) Soft, comfortable fluorescent light in banks and offices for faster, more accurate work. For leadership in lighting, today and tomorrow—watch Westinghouse!

LET'S ALL KEEP BACKING THE ATTACK . . . BUY MORE WAR BONDS!

FOR SEE-ABILITY

Building today's super-powerful aircraft engine calls for a high level of *See-ability*. For each giant 2200 horsepower motor made in this plant demands 80,000 machining operations and 50,000 inspections—130,000 vital seeing jobs where improper lighting could mean a serious, delaying error. *See-ability*—made possible by today's high-efficiency Westinghouse Mazda Lamps—enables workers to combine hairline accuracy with high speed operation, cuts down eye-strain and fatigue. Consult your Westinghouse dealer about *See-ability* with bright, long-lasting Westinghouse Mazda Lamps, or write Westinghouse Electric & Manufacturing Co., Bloomfield, N. J. Plants in 25 cities . . . offices everywhere.



Westinghouse

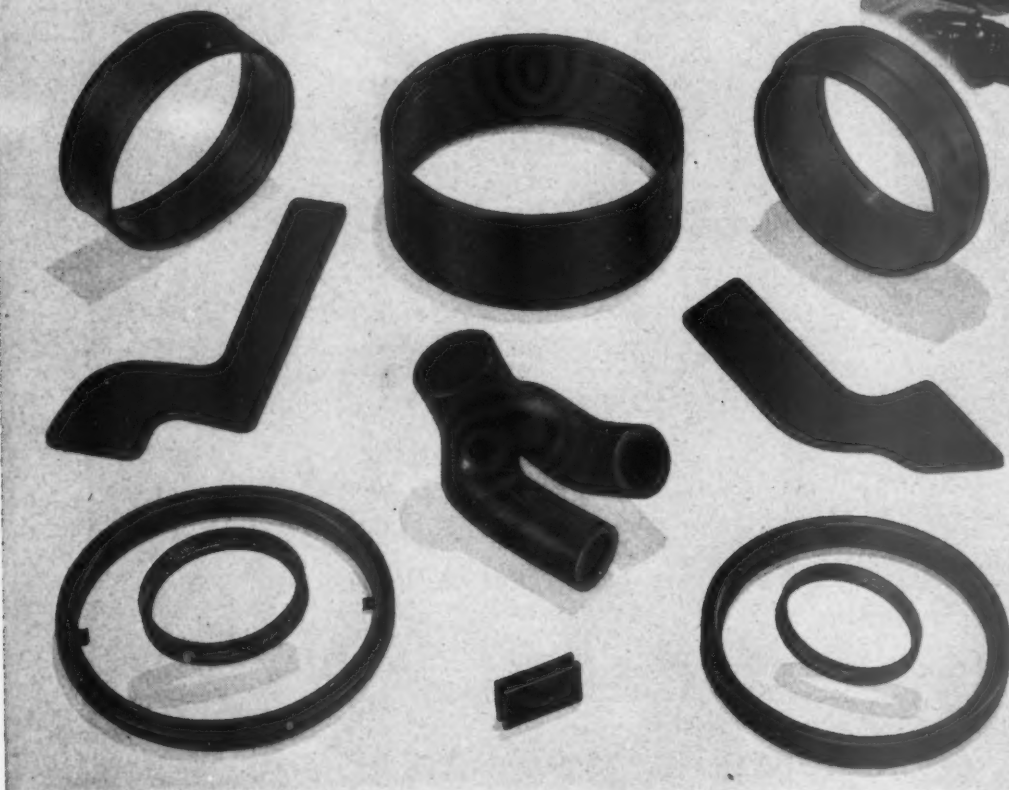
MAZDA LAMPS FOR SEE-ABILITY

Enjoy the Westinghouse radio program with John Charles Thomas,
NBC—Sunday—2:30 p.m.—E.W.T.

*-and thanks to "Ohio Rubber"
we're all set on these parts!*



Far-sighted companies, now engaged 100% on war production, are planning ahead on non-military products to minimize change-over delays. The Ohio Rubber Company is co-operating to the point of planning production schedules for prompt action when war-time restrictions are modified or removed.



What are YOUR "parts problems" involving rubber or synthetic rubber? Do you seek improved properties of materials to meet more exacting specifications? Is it a seemingly "impossible job" of molding hard or soft rubber or synthetic rubber? Possibly it's an extruded part of unusual characteristics. Or, it may be a combination of problems including adhesion of rubber or synthetic rubber to metal or some other material. Of course, you may be concerned only with lowering costs on present parts which means a more efficient source of supply than your present source. If your problems fit somewhere in that group, try "ORCO-OPERATION."



"ORCO-OPERATION"

THE OHIO RUBBER COMPANY · WILLOUGHBY, OHIO

NOW

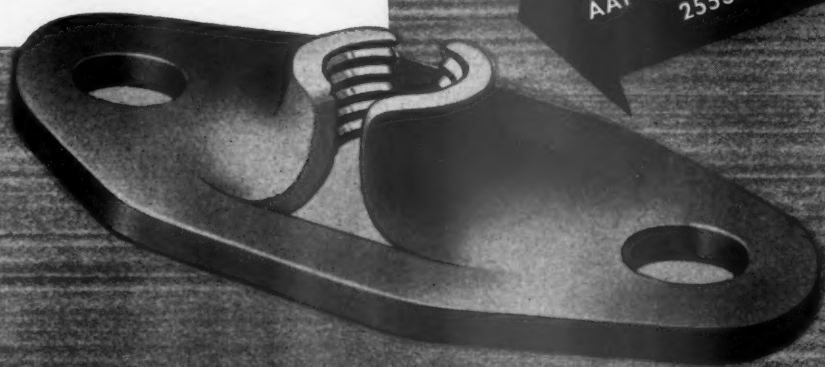
For

HIGH TEMPERATURE APPLICATIONS

“HI-STRESS”

Speed Nuts
[PATENTED]

A6103H-1032
CONFORMS TO
AAF SPECIFICATION
25531



in all Structures

- The new “Hi-Stress” SPEED NUT conforms to AAF specification No. 25531 and has been granted engineering approval by the Army Air Forces. It is interchangeable with nut plate AN362, for high temperature applications in all structures.

This new SPEED NUT is a lighter weight, one-piece integral unit. Because of its unusually low installation torque, it allows more rapid insertion of bolts or screws. Even after many removals under service conditions, this new SPEED NUT still retains its self-locking torque. Identify by SPEED NUT No. A6103H-1032.

TINNERMAN PRODUCTS, INC.

2050 FULTON ROAD

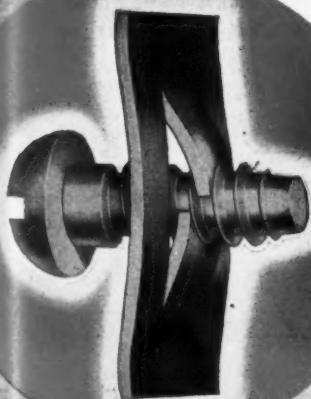
CLEVELAND 13, OHIO

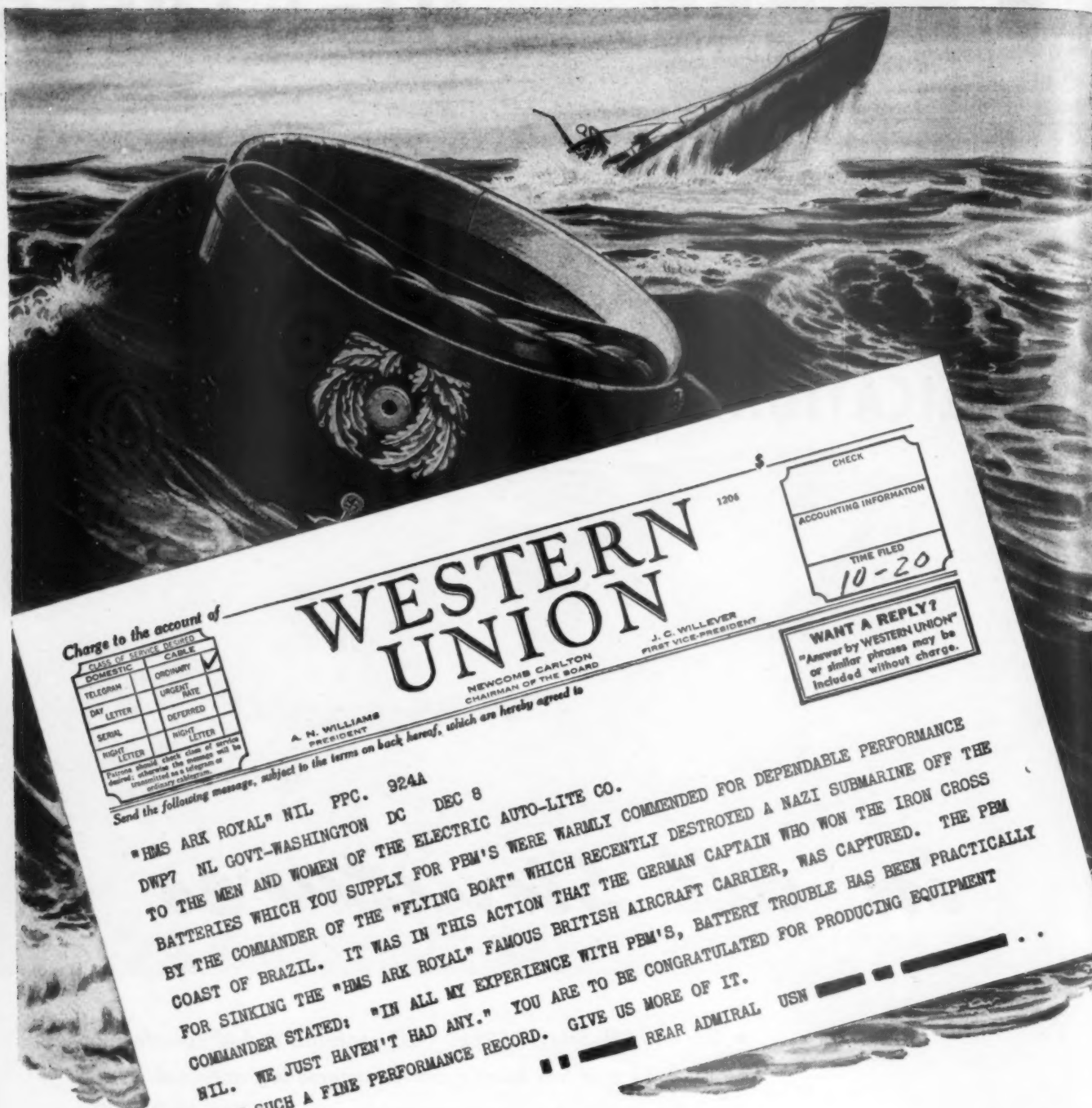
In Canada: Wallace Barnes Co., Ltd., Hamilton, Ontario

In England: Simmonds Aerocessories, Ltd., London

* TRADE MARK REG.
U. S. Patent Office

SPEED NUTS - THE FASTEST THING IN FASTENINGS!





Charge to the account of

| CLASS OF SERVICE DESIRED | |
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| DOMESTIC | CABLE |
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1206

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ACCOUNTING INFORMATION

TIME FILED
10-20

WANT A REPLY?
"Answer by WESTERN UNION" or similar phrases may be included without charge.

Send the following message, subject to the terms on back hereof, which are hereby agreed to

"HMS ARK ROYAL" NIL PPC. 924A
DWP7 NL GOVT-WASHINGTON DC DEC 8
TO THE MEN AND WOMEN OF THE ELECTRIC AUTO-LITE CO.
BATTERIES WHICH YOU SUPPLY FOR PEM'S WERE WARMLY COMMENDED FOR DEPENDABLE PERFORMANCE BY THE COMMANDER OF THE "FLYING BOAT" WHICH RECENTLY DESTROYED A NAZI SUBMARINE OFF THE COAST OF BRAZIL. IT WAS IN THIS ACTION THAT THE GERMAN CAPTAIN WHO WON THE IRON CROSS FOR SINKING THE "HMS ARK ROYAL" FAMOUS BRITISH AIRCRAFT CARRIER, WAS CAPTURED. THE PEM COMMANDER STATED: "IN ALL MY EXPERIENCE WITH PEM'S, BATTERY TROUBLE HAS BEEN PRACTICALLY NIL. WE JUST HAVEN'T HAD ANY." YOU ARE TO BE CONGRATULATED FOR PRODUCING EQUIPMENT WITH SUCH A FINE PERFORMANCE RECORD. GIVE US MORE OF IT.
REAR ADMIRAL USN

The "Ark Royal" is avenged

The score of an "assist" in wiping out the submarine menace is typical of the service Auto-Lite units are rendering on battlefronts all over the world . . . From PBMs to jeeps, from combat wagons to crash boats, Auto-Lite is piling up a continuing record for "producing equipment with a fine performance record." . . . It is the unfailing performance of Auto-Lite units

that makes the name internationally famous as the electrical equipment to use whenever dependability is a must. Important in establishing this enviable world-wide reputation is Auto-Lite's complete service so readily available everywhere.

THE ELECTRIC AUTO-LITE COMPANY
SARNIA, ONT. TOLEDO, 1, OHIO

TUNE IN "EVERYTHING FOR THE BOYS" STARRING RONALD COLMAN—EVERY TUESDAY NIGHT—NBC NETWORK

AUTO-LITE





No matter how well, accurate, close measuring tools may be made, they all must have careful use to protect them from injury and premature wear. You must "Treat 'Em Right" to get the full service they can give you.

Today with tools truly weapons, following these simple rules will help:

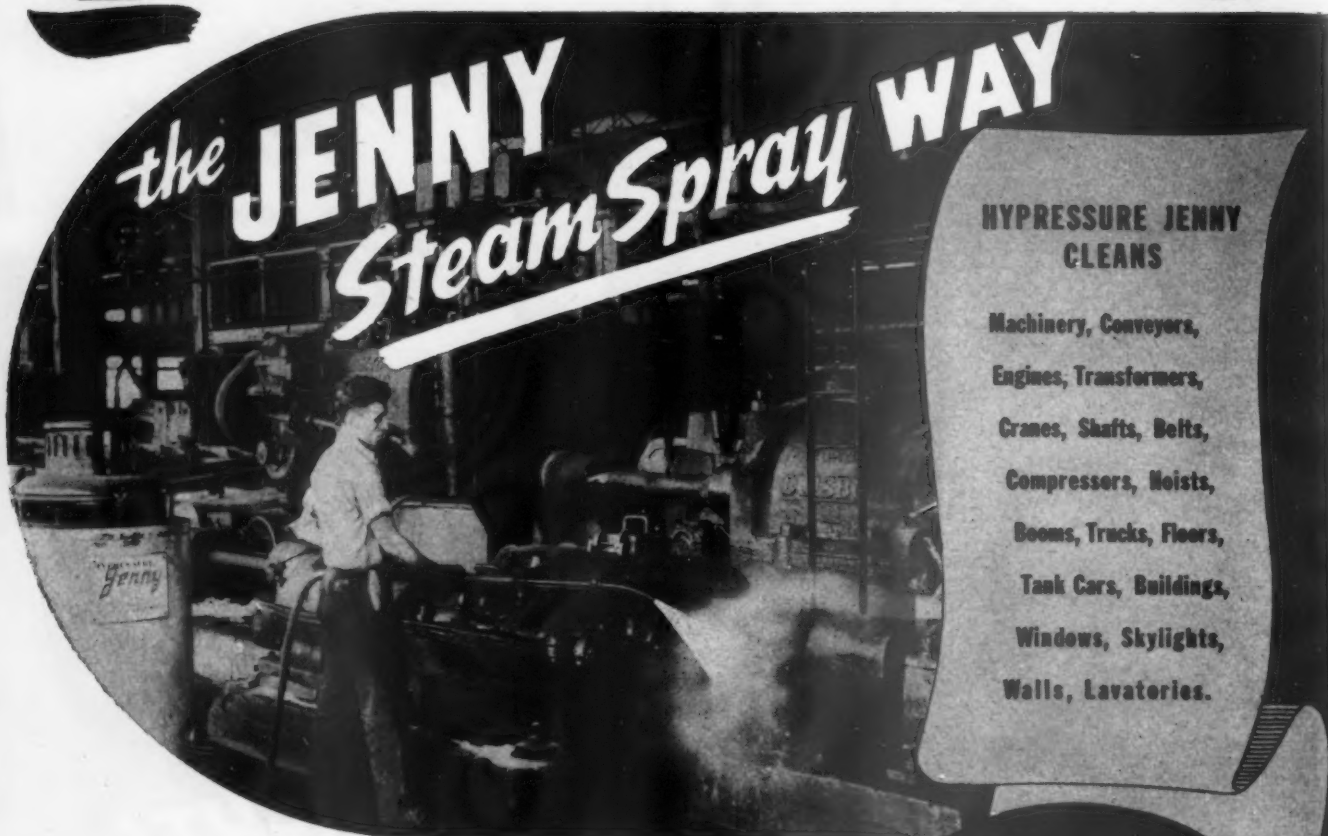
1. Set tools down carefully.
2. Protect tools from grit or abrasive.
3. Wipe tools with an oily rag to prevent rusting.
4. Keep tools in a wooden box or case.
5. Don't force measuring points.
6. Don't measure moving work.

Simple precautions — but they'll make **more tools** available for **more production** during this emergency.



BROWN & SHARPE TOOLS

1 MAN DOES THE WORK OF 8



HYPRESSURE JENNY CLEANS

Machinery, Conveyors,
Engines, Transformers,
Cranes, Shafts, Belts,
Compressors, Hoists,
Booms, Trucks, Floors,
Tank Cars, Buildings,
Windows, Skylights,
Walls, Lavatories.

And besides doing a better job 8 to 10 times faster, cleaning machinery the Jenny Steam-Spray Way before repairs, saves 25% to 40% of mechanics' time usually lost wiping dirt and grease from tools and equipment. Hypressure Jenny has cut one mid-western mill's window cleaning costs from \$16 per 1000 sq. ft. to \$2 per 1000 sq. ft. ... is saving an industrial plant \$4,500 every year on floor cleaning alone... has reduced another's machinery cleaning costs \$750, besides speeding up entire factory output. The Jenny Steam-Spray Way is the fastest, most thorough and most economical cleaning method known. It combines in a steam vapor spray, just the right amounts of steam, highly atomized hot water, cleaning compound and pressure to do a 100% cleaning job. It dissolves, cuts and flushes grease, oil and dirt from surfaces almost instantly. ● Write for free survey showing how the Jenny Steam-Spray Way can save you man-hours and money on all your cleaning jobs.



Built for general industrial service, Hypressure Jenny rolls right to the job—through doorways, onto elevators, along aislesways, etc. Plugs in at ordinary light sockets. Requires no boiler inspection. Entirely automatic. Operated by regular plant labor.



Maritime's two-flag, highest production award to our men and women making valves for the Victory Fleet.

HYPRESSURE JENNY DIVISION OF

HOMESTEAD VALVE MFG. CO.

P. O. BOX 93 CORAOPOLIS, PA.



(Courtesy Yerkes Observatory)

Clear Picture to the Strong Eye



HIGH DIELECTRIC STRENGTH



**LOW MOISTURE ABSORPTION
CORROSION RESISTANCE**



COMPRESSIVE STRENGTH



TENSILE STRENGTH



FLEXURAL STRENGTH



IMPACT STRENGTH



**STABLE OVER A
WIDE TEMPERATURE RANGE**

Many More Properties—Combined

THE Andromeda Nebula was just a blur in the sky until an inquiring mind and a telescope brought it into focus. Electricity was an awesome phenomenon until someone discovered how to use it. So it goes with all the unexposed realities in nature and science.

The future of plastics, in spite of already-known practical applications for them, is still a "blur in the sky." Engineers are getting a closer, sharper

picture of what can and cannot be accomplished with them. The war has accelerated interest and action. But most of the work is ahead. The stimulus often, and logically, comes from the prospective user who knows his own requirements . . . from you, for example. If you'll write and tell us these requirements, we'll be glad to let you know, or find out, whether our type plastics will help.

SYNTHANE CORPORATION, OAKS, PENNSYLVANIA

Plan your present and future products with Synthane Technical Plastics

SHEETS • RODS • TUBES • FABRICATED PARTS

SYNTHANE

MOLDED • LAMINATED • MOLDED-MACERATED

SYNTHANE "Sandwich" Materials

One of the advantages of Synthane is the ease with which it can be bonded to other materials to produce a substance with the combined advantages of the partnership. Bonding takes place under heat and high pressure, during the polymerization of the Synthane; it is not a mere joining of two surfaces with an adhesive. The resulting combination, therefore, shows little or no tendency to delaminate.

Synthane combinations are familiarly known as Synthane "sandwich" materials, an appropriate name, for many different kinds of combinations are possible.

Probably the most widely used combination brings Synthane and rubber together.



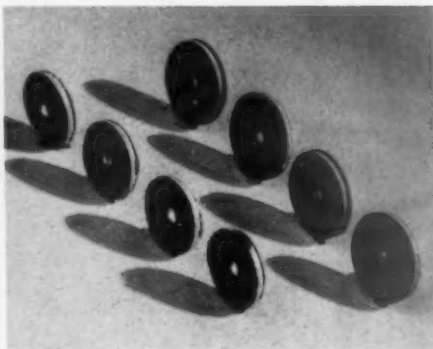
Synthane-Rubber

Synthane-rubber combinations are advantageous where the strength of Synthane is desirable to back up rubber.

An interesting application concerns a washer used in electrolytic and oil type condensers. The washer is placed on the end of tin can electrolytic con-

densers with the Synthane face exposed to the chemicals to prevent deterioration. The can is crimped into the rubber to make a tight seal.

A similar washer is used on "bath-tub" condensers. Tough Synthane provides a firm seat for a nut which compresses the rubber to form a tight joint.



Combinations of rubber and Synthane have been furnished with rubber on one side, Synthane on the other; rubber on both sides with Synthane between; Synthane on both sides and rubber between; and alternate laminations of rubber and Synthane built up to any desired thickness.

There are many more possible uses for Synthane-rubber sandwich materials, which we cannot describe because of military censorship. There are also many important uses for a combination of Synthane and Neoprene.

Synthane-Synthane

Occasionally two grades of Synthane are combined. For instance, in certain radio tube sockets, layers of fabric



and paper base Synthane are combined. The paper base has usually better electrical properties while the fabric base furnishes added strength where the stress is greatest.

Bobbin heads in the textile industry are often made of paper and fabric bases combined. The fabric base endures rough handling, whereas the paper base on the inside of the head provides a smooth wearing surface.

Synthane-Asbestos

Synthane is wound about asbestos (or fibre) tubes and cured in the manufacture of tubing for large fuse cases. Synthane adds strength and rigidity to the fire resistance of the asbestos or fibre.

Synthane-Other Materials

Synthane can be united with a variety of materials to produce a variety of practical combinations. We have made or experimented with other combinations. If you have any combination in mind which we have not explored, we will be glad to investigate its possibilities for you.

PLAN YOUR PRESENT AND FUTURE PRODUCTS WITH SYNTHANE. TECHNICAL PLASTICS



SHEETS-TUBES-FABRICATED PARTS-MOLDED-LAMINATED-MOLDED-IN-CASTING

SYNTHANE CORPORATION, OAKS, PENNA.
REPRESENTATIVES IN ALL PRINCIPAL CITIES

DEPENDABLE...



... so are **MORSE TOOLS**

That's why time out for replacing and resharp-
ening is reduced when you use Morse Tools.

TOOLS ARE WEAPONS --- TREAT 'EM RIGHT!

MORSE

**THERE IS A
DIFFERENCE**

**TWIST DRILL AND
MACHINE COMPANY**

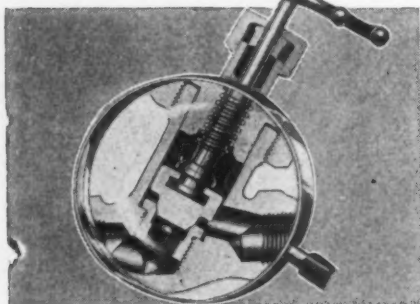
NEW BEDFORD, MASS., U. S. A.

NEW YORK STORE: 130 LAFAYETTE ST. - - - CHICAGO STORE: 570 WEST RANDOLPH ST.

How to buy a *Forged Steel Stop* VALVE ...

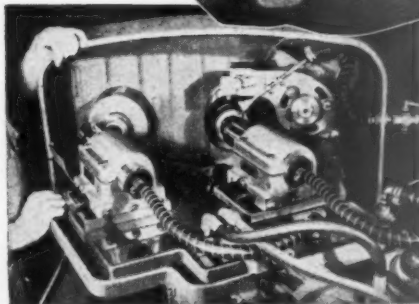
THERE'S more to buying a forged steel stop valve than a figure number, a price and a purchase order if you're interested in fitness for tough service and the real economy of long life and low maintenance. It's the important details of design, construction and processing of each material and part that makes the difference in forged steel stop valves.

Here's what to look for!



1 THE "WEAR ZONE"

Here's where a valve takes the most punishment. Edward builds extra life and extra protection against corrosion and erosion into this "wear zone" through EValloy stainless steel or Stellite seats and disks. Threads of both the seat and body are of the finest Class 4 commercial fit.



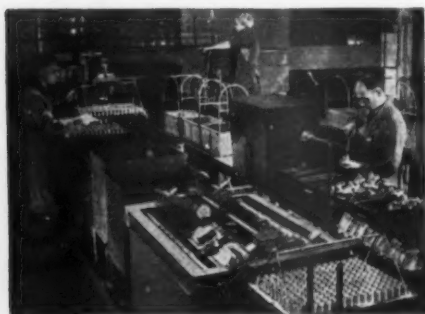
2 DROP TIGHT FIT

Seats and disks for Edward forged steel stop valves are precision bored in pairs on special machines (above). Mated seats and disks, absolutely concentric and smooth, show practically 100 per cent bearing surface when tested with blued gages. The result—droptight valve closure.



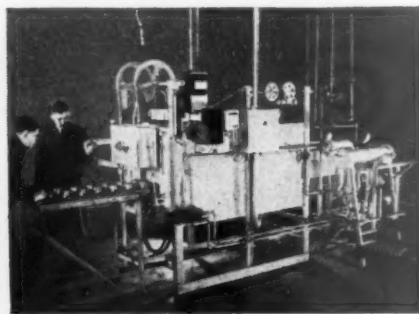
3 EASY OPERATION

Handwheels are mighty important. Handwheels for Edward forged steel stop valves are strong malleable iron, knobbed and easy to grip even with wet hands. Oversize dimensions facilitate operation. No other manufacturer puts larger handwheels on steel valves of like size.



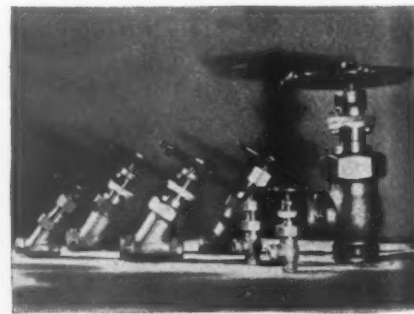
4 EVALIZED SURFACES

EValizing, the new exclusively Edward plating process, adds years of service to stem bearing surfaces, protects other exposed surfaces such as packing nuts, bonnets, junk rings, etc., against rust, corrosion and abrasion. Above, a section of the Edward plating department.



5 PROPER PROCESSING

Bodies, bonnets, seats, disks—all principal parts of Edward steel stop valves go right from the drop forge hammers to special furnaces, like the one above, for heat treatment under the control of Edward metallurgists for protection against indeterminate stress in service.



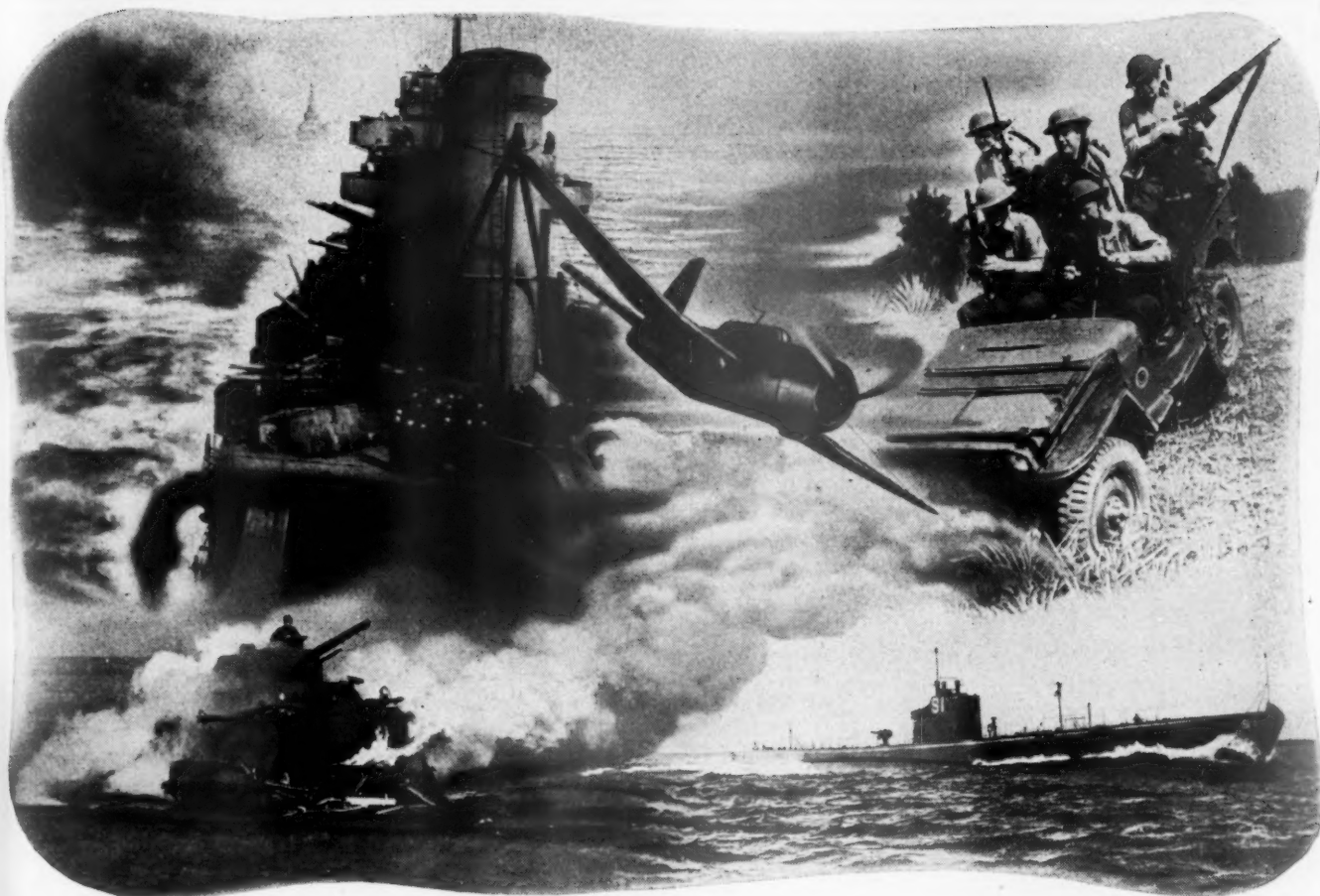
6 WIDE ADAPTABILITY

Globe or angle, inside screw or O.S. & Y., sizes 1/4 in. to 2 in., screwed ends or ideally proportioned socket welding ends. But in every size and type, they're all steel, equal to any stress or strain. For illustrations, dimensions and concise data on the Edward line, write for Cat. No. 101.

THE EDWARD VALVE & MFG. CO., INC. • EAST CHICAGO, INDIANA

EDWARD *Steel* VALVES





PERMITE SPECIFICATION FINISHES

Serve On All Fronts

THE armor-like protection against moisture and heat penetration given by PERMITE Aluminum Paints to land, sea and air fighting craft, is typical of the wartime finishing problems solved by the use of Permite Industrial Finishes.

Ammunition manufacturers have also proved by careful tests that they could get faster application, reduce drying time, increase production through the use of Permite Government Specification

Lacquer Enamels, custom-built to their requirements.

Many knotty war production finishing problems are solved through the co-operation of Permite chemists, drawing upon their years of experience in producing varnishes and exclusive vehicles for Permite Ready-Mixed Aluminum Paints.

Permite Government Specification Finishes for war production include clear and colored lacquers, zinc chromate primers, enamels, mixing varnishes, camouflage paints, and rust inhibitors. We also supply Permite Aluminum Paints on WPB allocation.

Quotations and Technical Information Submitted Promptly Upon Request.

ALUMINUM INDUSTRIES, Inc., Cincinnati, Ohio



PERMITE *Industrial* FINISHES

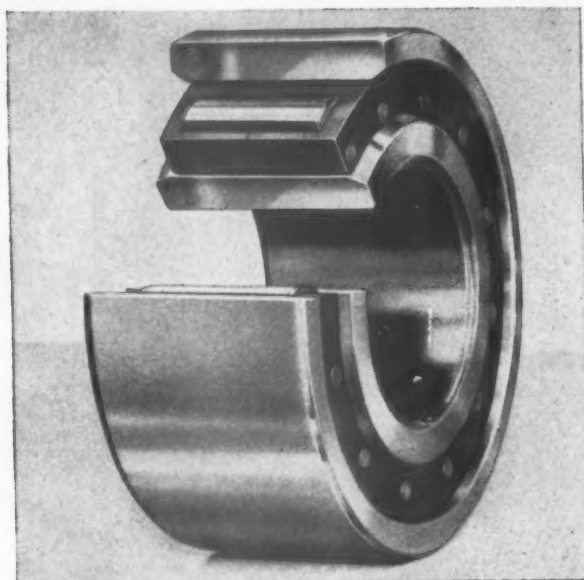
NEW ROLLWAY BEARINGS

**Earn 20 Times Their
Investment Cost Annually**

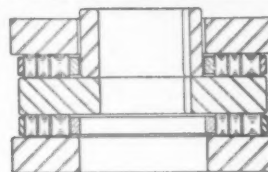
**Let Us Analyze the
Possibilities of Rollway Bearing
Equipment in YOUR Plant**

Think of it—just four Rollway bearings (two Couch Roll bearings and two Pressure Roll bearings) actually earned \$250.00 per day or \$75,000.00 per year for one plant. And when we say earned, we mean increased production that yielded a \$75,000.00 gain in annual profit. *More than 20 times the cost of the bearings*, to say nothing of an average saving of 31 horsepower.

We don't say that every plant can show comparable gains simply by installing Rollway bearings, but we do believe that Rollway's right-



Type CS
Double Width
Radial



Type DT
Double Acting
Thrust

angle loading of bearings will give the average plant:

1. Marked increase in bearing life.
2. Marked improvement in the speed-load-life ratio of bearings.
3. Marked decrease in bearing replacements, shaft wear and maintenance time.



Simplifies the Load...

Rollway's right-angle loading splits the load into its two simple components of pure radial and pure thrust—each carried by a separate roller assembly. It eliminates all compound loads, all oblique loads and resultants, insuring greater load capacity in any given dimensional limit. There's no pinching effect to force rollers out from between the races, hence less roller-end wear-back and less rubbing or sliding friction. Starting and running torques are both lower; power consumption goes down.

Write today; let a Rollway engineer make a free bearing analysis of your plant; let us estimate the savings or earnings you might reasonably expect from Rollway's Right-Angle Loading.

ROLLWAY

BEARING COMPANY, INC., SYRACUSE, NEW YORK

BUILDING HEAVY-DUTY BEARINGS SINCE 1908

BEARINGS

An Important New Publication

[ENGINEERING HANDBOOK]

"MECHANICAL SPRINGS, *Their Engineering and Design*"

Whether you buy, use or design mechanical springs, this new engineering handbook will prove interesting and practical. Its purpose is to collect and present charts, tables and formulas upon which the engineering and design of mechanical springs are currently based. The material offered represents the research and knowledge of the combined engineering forces of the several Divisions of the Associated Spring Corporation. Helpful pointers on the selection of materials, types of springs, methods of calculation—all appear in easy-to-read, simple language.

A copy will be sent to any executive, engineer, designer, or purchasing agent who is interested in Springs. Use the coupon, or request it on your letter-head, and address to the nearest Division, or the Division you customarily contact.

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CANADA
The WALLACE BARNES CO., LTD.
HAMILTON, ONTARIO

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(FILL IN NAME OF DIVISION ABOVE)

ADDRESS _____

PLEASE SEND THE NEW ENGINEERING HANDBOOK
"*Mechanical Springs, their Engineering and Design*"

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

DIVISIONS OF ASSOCIATED SPRING CORPORATION



How to beat ***SURPLUS INVENTORY!***

What with cancellations, cutbacks and design changes, these are days to check every source of excess inventory. It's time to start streamlining your stocks—to get "light on your feet" for the future.

To help beat the "surplus" problem, why not buy more of your steel from warehouse? By buying only what you need for immediate production, you avoid leftovers and dead stock when contracts change. Frasse stocks of cold finished bars, tubing, stainless steel, alloy and aircraft steels and tubing are now in good shape. By ordering from Frasse as you go, there's no surplus to fear when contracts are cancelled or cut back.

Your future operations can be seriously hampered by heavy, awkward surpluses. Why pile up more? Start streamlining today by using Frasse inventories instead.

Frasse

MECHANICAL AND AIRCRAFT STEELS

SEAMLESS MECHANICAL AND AIRCRAFT TUBING • COLD FINISHED BARS • ALLOY STEELS
AIRCRAFT STEELS • DRILL ROD • STAINLESS STEELS AND TUBING • COLD ROLLED STRIP AND SHEETS • WELDED STEEL TUBING

Peter A. Frasse & Co., Inc. 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Phila. 29, Pa. (Radcliff 7100 - Park 5541)
50 Exchange Street, Buffalo 3, New York (Washington 2000) • Jersey City, N. J. • Hartford, Conn. • Rochester, N. Y. • Syracuse, N. Y.



Oxweld Apparatus and Supplies

Oxweld apparatus includes blowpipes, attachments, regulators, manifolds, cutting machines, acetylene generators, and related equipment and supplies for every application of the oxy-acetylene process. From this equipment you can select exactly the items needed to make up an outfit that is complete and efficient for your specific job. An Oxweld outfit assembled for general purpose welding and intermittent light cutting is illustrated above.

Oxweld oxy-acetylene apparatus is supplied

from Linde offices and warehouses. Rods, fluxes, and supplies may be ordered directly from Linde, or from automotive and industrial jobbers.

Catalogs describing Oxweld apparatus and a descriptive price list of Oxweld welding rods, fluxes, and supplies, will be sent to you on request. When requesting Oxweld apparatus catalogs, please specify the types of equipment in which you are interested.

BUY UNITED STATES WAR BONDS AND STAMPS



THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation



30 E. 42nd St., New York 17, N. Y. Offices in Other Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto



A NEW PLASTIC*

* 1421 CAST ROD

FORM AVAILABLE
Cast Rod Maximum length—10'

PHYSICAL PROPERTIES

COLOR—pale yellow to water white

MACHINABILITY—good, similar to brass

SPECIFIC GRAVITY—1.04-1.06

IMPACT (Dynstat)—.07-.08 ft. lbs.

FLEXURAL STRENGTH—
(Dynstat) 7500-10,000 lbs./sq. in.

WATER ABSORPTION—
less than 0.1% in 24 hrs.

DIELECTRIC CONSTANT—2.4 to 2.5

POWER FACTOR—.0006-.0009

SOLVENT RESISTANCE—Generally insoluble in most solvents but swells in aromatic hydrocarbons.

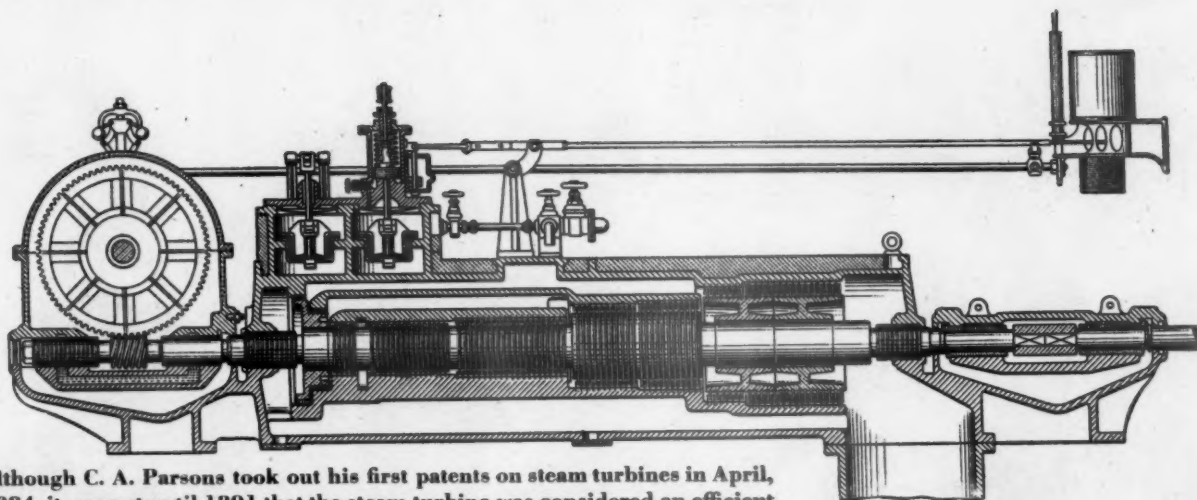
The General Electric Plastics Divisions have developed a new material with unusual characteristics. This new plastic has the ability to withstand very high temperatures without melting. It has high dielectric strength, low power factor, and low dielectric constant. This material has been successfully used for applications in the radio industry where other plastic materials have proved unsatisfactory. For further information write section B-203, One Plastics Avenue,* Pittsfield, Mass.

Hear the General Electric radio programs: "The G-E All-girl Orchestra" Sunday 10 P.M. EWT, NBC. "The World Today" news, every weekday 6:45 P.M. EWT, CBS.

GENERAL  ELECTRIC
BUY WAR BONDS

PD-908

In 1891 a one-job oil was good enough ...



Although C. A. Parsons took out his first patents on steam turbines in April, 1884, it was not until 1891 that the steam turbine was considered an efficient machine. Shown above is a cross-section of the general arrangement of an early Parsons' steam turbine that ran at relatively low pressures and temperatures. All that was required of a turbine oil then was that it lubricate.

The compactness and high operating efficiency of the modern steam turbine calls for a lubricant that must do more than just lubricate. A turbine oil today must also prevent rust, have superior oxidation stability.

BUT TODAY'S TURBINES NEED THIS **2-JOB** TURBINE OIL!

1. That prevents rust
2. That has superior oxidation stability

THE MODERN, high-speed turbines of today with their closer clearances, high-steam temperatures and pressures, need more than a good lubricant. They need an oil that *prevents rust* as well as one that has *superior oxidation stability*. One that is suitable for use in governors as well as bearings. Shell Turbo Oil has both characteristics, because Shell Turbo Oil was designed from the start as a 100% turbine oil.

Because your turbines may be humming merrily along right now is no guarantee they will continue to do so.

Be sure your turbine oil is doing both jobs. Call in the Shell man. Let him show you samples of Shell Turbo Oil ... the 2-job turbine oil that right now is performing in the turbines of our battleships, destroyers, cruisers and other units of our fleets ... doing a job that is far tougher than any it will be required to do on land. In fact, Shell Turbo Oil was the first of its type to be approved as meeting rigid U. S. Navy specifications.

If you are not close to a Shell office, write Shell Oil Company, Inc., 50 West 50th Street, New York 20, New York, or 100 Bush Street, San Francisco 6, California.



TURBO OIL



Dodge Transmissioneers Put ALL the Power to Work

Dodge Transmissioneering service available through qualified and experienced Dodge Transmissioneers in every important industrial center puts all the power into the job with "The Right Drive for Every Job."

Dodge Transmissioneers know how to insure continuous low cost operation, increase production and eliminate production delays through application of modern transmissioneering practice which starts with a study of practical production engineering requirements and stops with "The Right Drive for Every Job."

Dodge Transmissioneers provide drives assembled from standardized, precision-made parts which in many cases means quick solution of drive problems because of the immediate availability of the necessary equipment from local stock.

Call your local Dodge Transmissioneer—his service is as close as your telephone.

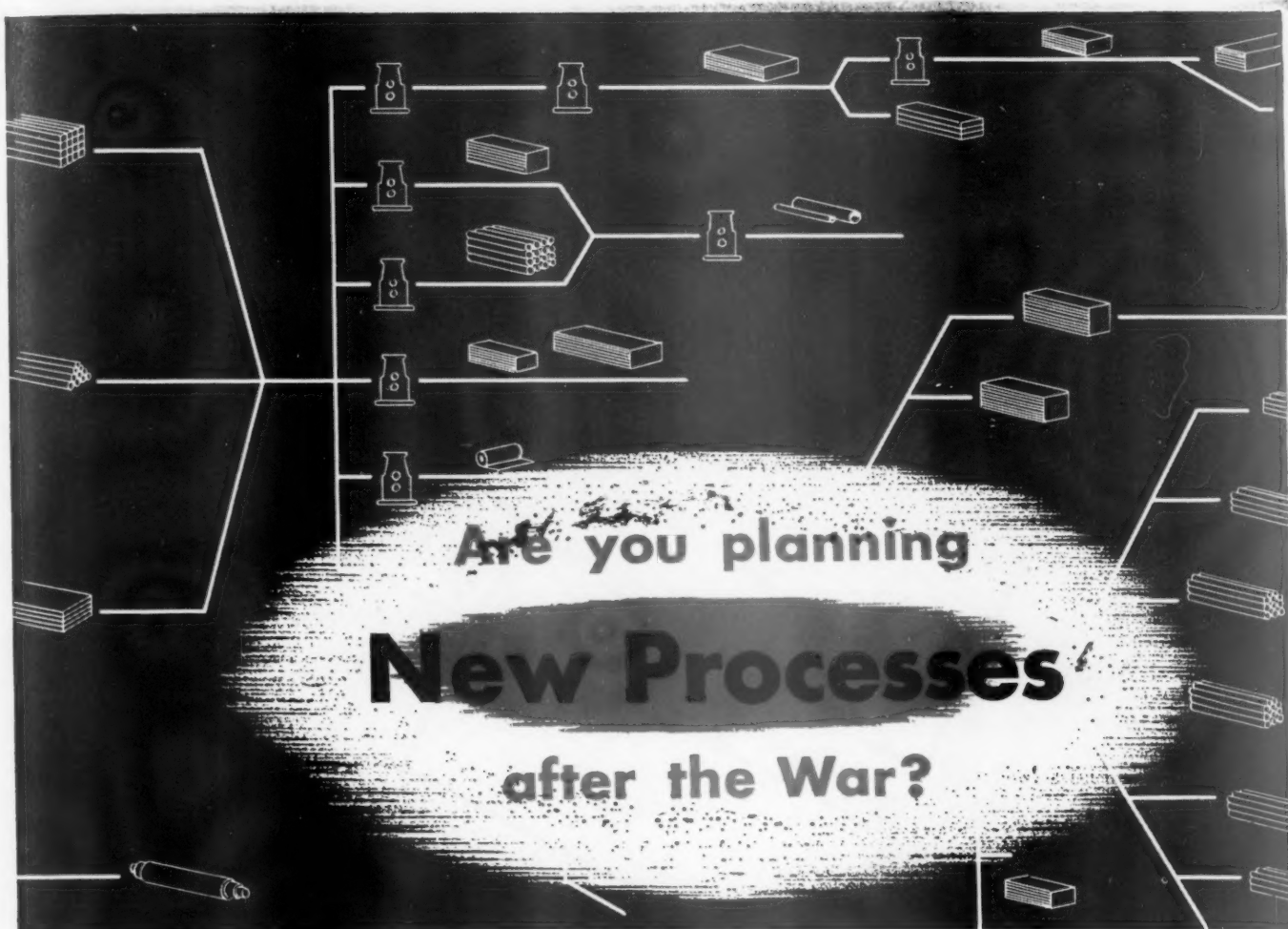
DODGE MANUFACTURING CORPORATION
Mishawaka, Indiana, U. S. A.



BUY MORE
WAR BONDS



"Transmissioneering starts with the study of Practical Production Engineering requirements and stops with the Right Drive for Every Job."



INTERESTING new processes are just over the horizon for many industries—employing new materials, producing new commodities.

Most of these new processes—including *yours*, no doubt—will require holes by the thousands or the millions in the future as heretofore. Holes drilled and reamed in multiples. Good holes, accurate holes—holes produced *for less money*. Cle-Forge High Speed Drills and Peerless High Speed Reamers can help you keep production up and costs down on any material.

“Cleveland” men can help you plan ahead—your Industrial Supply Distributor can help you too.

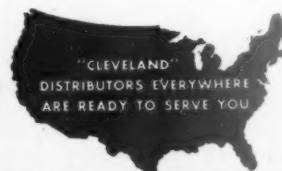
He is trained in keeping you supplied with hundreds of different items needed in your daily production—he is trained to order ahead to save you from running short. Your Distributor is giving you a priceless lift today and will be still *better* trained to serve you in the years ahead.

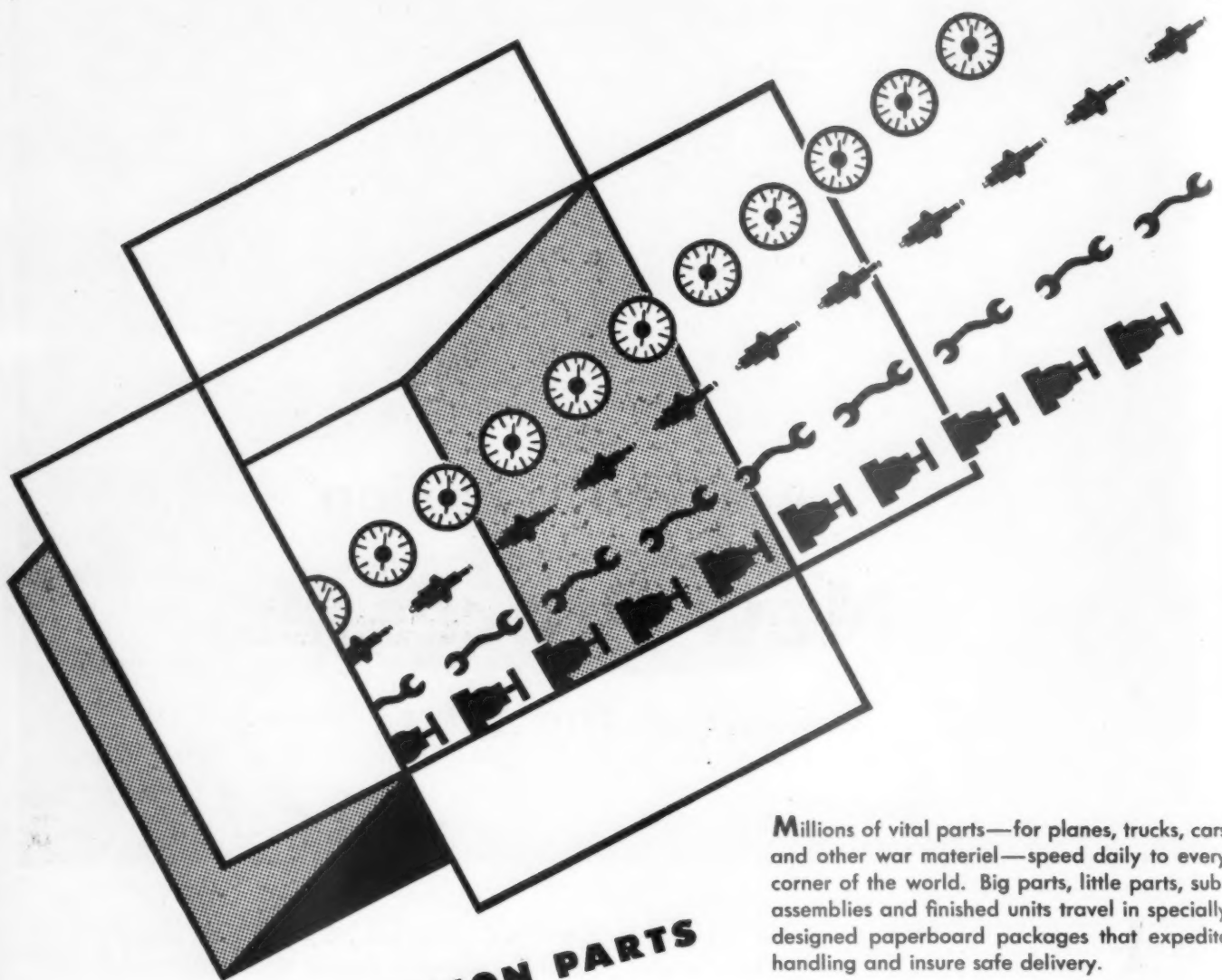
Until the Emergency ends—and in all your peacetime operations to come—make it your business *always* to

Telephone your  **FIRST!**



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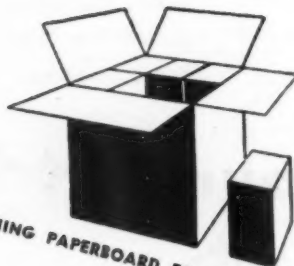
IT TAKES A MILLION PARTS

Millions of vital parts—for planes, trucks, cars and other war materiel—speed daily to every corner of the world. Big parts, little parts, sub-assemblies and finished units travel in specially designed paperboard packages that expedite handling and insure safe delivery.

- Container Corporation of America pioneered in the packing of machine and replacement parts. The practical knowledge, the skill and techniques we built up in peacetime have been made available to government agencies and war contractors.

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Typical motorized hand lift truck

GIVE YOUR
MOTORIZED HAND-LIFT TRUCKS THIS
**10% EXTRA WORK
CAPACITY**

WITHOUT INCREASE IN BATTERY BOX DIMENSIONS

WHEN materials pile up, that's when the 10% extra capacity built into Philco XL Batteries can be a life-saver!

In this ultra-modern storage battery designed by Philco, you'll find the extra reserve of power you need to keep your trucks on the job longer hours—to deliver the extra wallop when needed—to haul more material each day.

Let us show you how Philco XL extra capacity Batteries today are solving the materials handling problems at crowded war plants, warehouses and ports of embarkation. Write for Industrial Truck Battery catalog. See directory for local Philco representative.

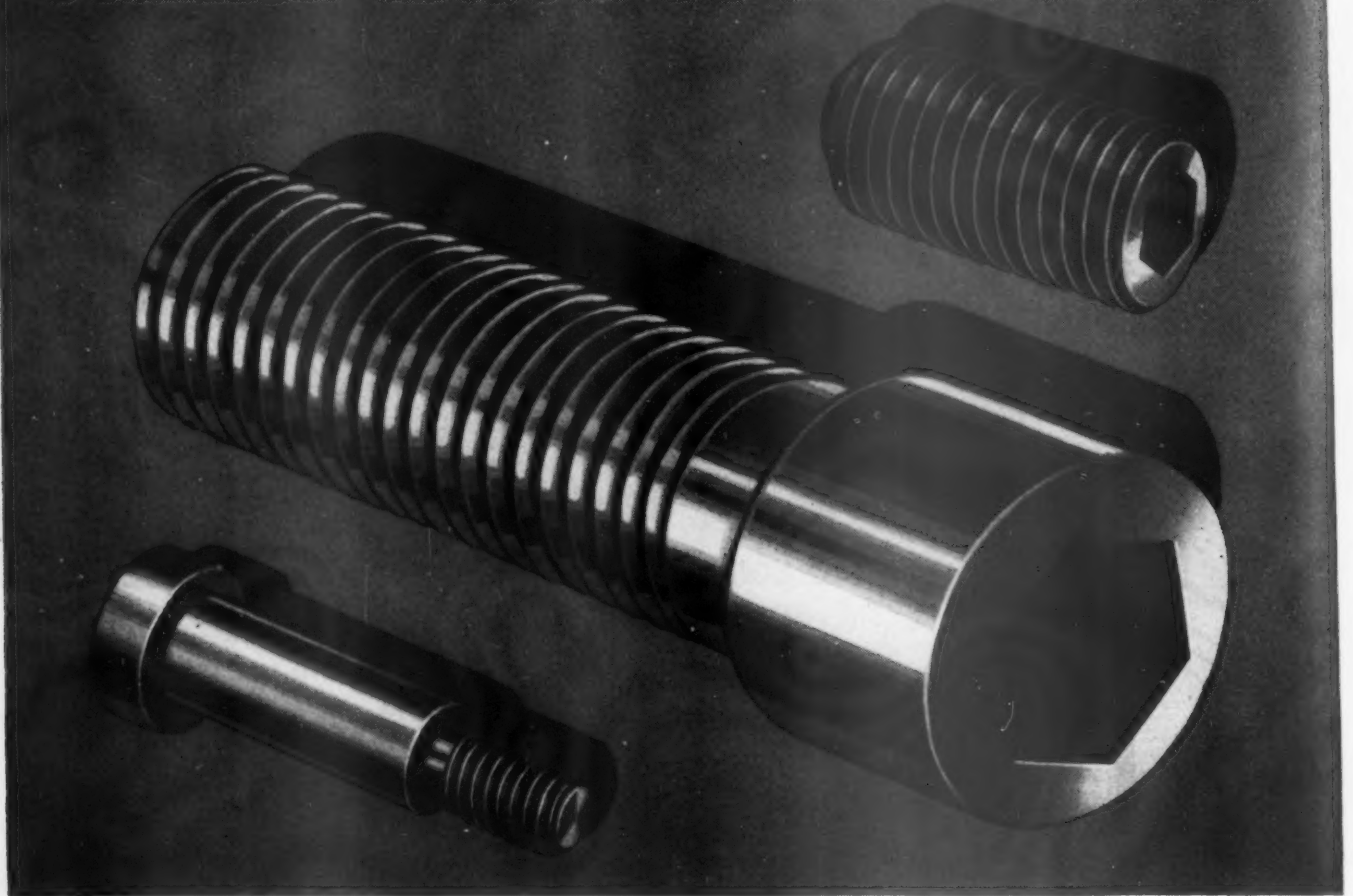
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INDUSTRIAL BATTERIES

6 cells of Philco Battery Type 11 XL

They have to be good to live up to the name
PARKER-KALON SOCKET SCREWS



--and unequalled Quality-Control makes sure!

Because users expect more of PARKER-KALON — the name that represents a quarter-century of leadership in fastening development — Parker-Kalon Socket Screws must measure up to an entirely new standard of quality.

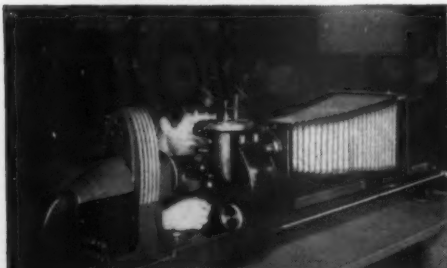
That's why every important characteristic is submitted to test. With the finest of modern equipment, a 16-point check-up is made in the Parker-Kalon Laboratory and Inspection Departments to cover Chemical Analysis; Tensile and Torsional Strength; Ductility; Shock Resistance

under Tension and Shear; Hardness; Head diameter, height, and concentricity; Socket shape, size, depth, and centrality; Thread fit.

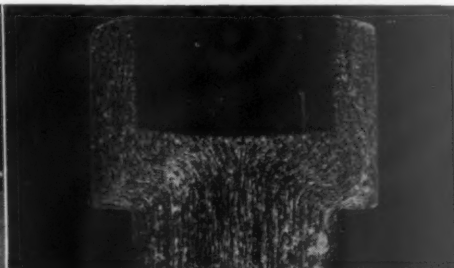
This unrelenting Quality-Control, without counterpart in the industry, makes sure that P-K Socket Screws are better than they need to be, in design, strength, accuracy, and uniformity.

Socket Screw users need this protection today more than ever. Specify "Parker-Kalon" next time you order... it costs no more. Parker-Kalon Corp., 202 Varick Street, New York 14, N. Y.

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MICROMETRIC ACCURACY



A Product of PARKER-KALON -- Specialists in Fastening Devices

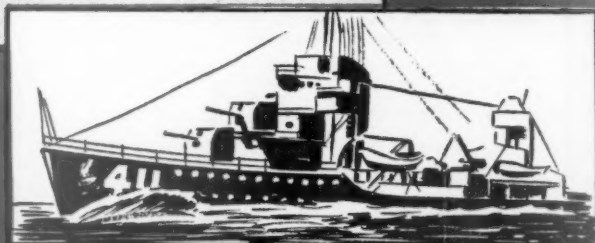
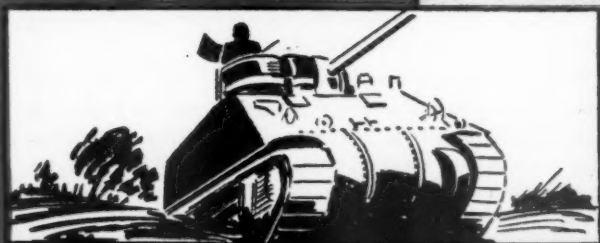


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CARBON and ALLOY STEELS**

Turned and Polished,
Turned and Ground
Shafting. Annealed,
Strain and Stress Re-
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Quenched and Tem-
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Flats Up to 12" x 2".

QUALITY-IDENTIFIED
Performance
IN EVERY VICTORY

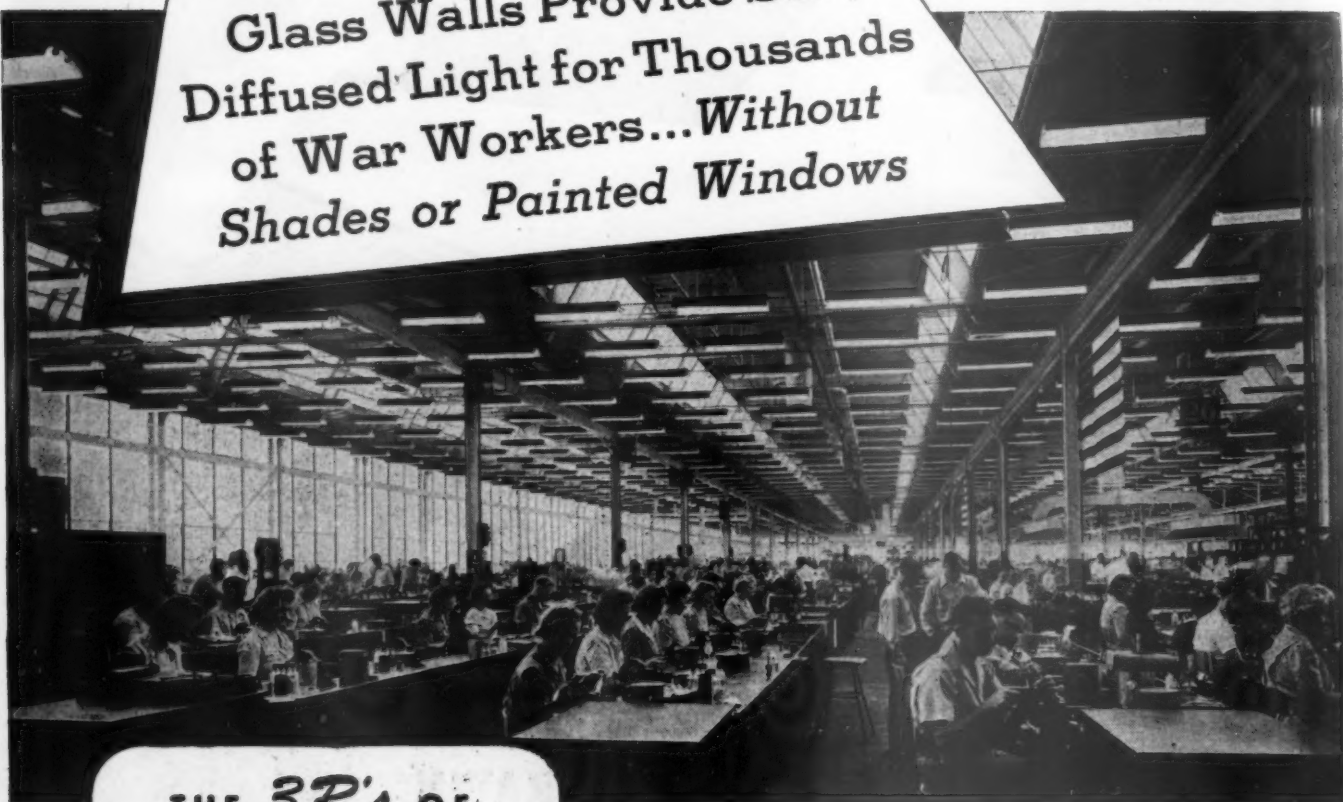


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COMPANY
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Mills at Ambridge, Pa. and Chicago, Ill.



HUGE WAR PLANT GETS NATURAL DAYLIGHT THROUGH BLUE RIDGE FROSTED AKLO GLASS

Glass Walls Provide Soft,
Diffused Light for Thousands
of War Workers...Without
Shades or Painted Windows



THE 3R's OF FROSTED AKLO



REDUCES GLARE—Eliminates eyestrain
and employee fatigue.



RETARDS SUN HEAT—Keeps workers com-
fortable on their jobs.



RENDERS SAVINGS—Eliminates shades
or painting of glass.

"Somewhere in the U.S.A." a great war plant's wheels are spinning—wartime products being produced at a tremendous rate for our boys overseas. Here, home-front workers have the advantage of the finest industrial lighting available. Actually, great walls of glass—Blue Ridge Frosted Aklo Glass—create a flood of soft, diffused daylight over the working surfaces. The photo above shows how this flood of daylight spreads evenly and without glare through the plant.

Where seeing is important, Frosted Aklo provides a distinct contribution to increased production and, at the same time, reduces employee fatigue because of reduced eyestrain. Frosted Aklo absorbs approximately 97½ per cent of the sun's infrared rays—increasing employee comfort. In air-conditioned areas it contributes to lowered operating costs . . . and it eliminates the necessity for costly painting of window glass or the use of window shades.

Frosted Aklo Glass is made by the Blue Ridge Glass Corporation of Kingsport, Tenn., and is sold by Libbey-Owens-Ford through leading glass distributors. It is available in hammered and ribbed patterns, both wired and unwired. Ask your glass distributor for additional information or write the Blue Ridge Sales Division, Libbey-Owens-Ford Glass Company, 6944 Nicholas Building, Toledo 3, Ohio.



BLUE RIDGE AKLO GLASS

Heat-Absorbing • Glare-Reducing • Figured and Wire Glass



"Turning Points" to Victory



Official U.S. Navy Photograph

MARINE MOWING MACHINE

The steel-scalloped border of American flat-tops bristles with fast-firing Bofors guns. In the hands of expert crews, these agile weapons reap attacking planes from the sky. The enemy's twists and turns are in vain. For the guns, guided by hand wheels and gears on frictionless ball bearings, outmatch each maneuver and add another to the windrow of wrecks in the carrier's wake.

Take the ball bearings from these Bofors and several hundred pounds of barrel, breech and recoil mechanism would

not lift and swing lightly to a bead on so swift a target. Fafnir Ball Bearings set our fighting machines free from friction, guard their turning points against ocean's corrosive salt and against every condition of heat and cold.

When peace returns, fighting men and their civilian backers will continue to see Fafnir Ball Bearings—to enjoy the frictionless power they provide—engineered once more to the uses of everyday life. The Fafnir Bearing Company, New Britain, Connecticut.

FAFNIR  **BALL BEARINGS**



*Buy War Bonds
and Stamps*



**Cool under fire —
because they've been heat-treated**

The best trained troops require tempering under fire to become seasoned fighters. Springs, too, need proper tempering to fit them for the rigorous demands of tough fighting mechanisms. Because heat-treatment is so vital to spring performance, its selection and control come within the realm of our laboratory technicians, with automatic regulation that insures parade-ground precision—precise action—long service. No guesswork—Barnes-made Springs are under strict discipline in every stage of manufacture. They obey your orders.

CONSERVE METAL—DESIGN WISELY

1918—
THEN

AND NOW

Barnes-made Springs
ENGINEERED PEP AND POWER

WALLACE BARNES COMPANY DIVISION OF ASSOCIATED SPRING CORPORATION
BRISTOL, CONNECTICUT, U. S. A.

SHORTS STYMIED

Voltage surges which accompany switching and frequent starting and stopping of motors impose high dielectric stresses on the coil insulation, and can cause harmful short circuits. Yet this is an unavoidable condition of service for many motors.

The grinder shown here, for example, starts and stops every time a finished part is removed and a new part inserted. But the two Tri-Clad motors that drive it have been built to withstand safely the voltage surges ordinarily encountered in this type of service. Their ability to "stymie" shorts was proved by the new General Electric test described below.

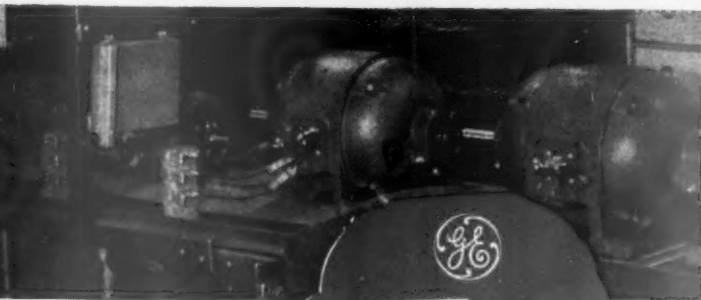


External grinder, equipped with two Tri-Clad motors, installed in the milk-machinery manufacturing plant of the Rite-Way Products Company, Chicago, Ill.

New high-potential, electronic surge-tester verifies strength of **TRI/CLAD** motor windings



This electronic test of insulation makes a "cardiogram" of every Tri-Clad motor winding, ferreting out weaknesses that might lead to shorts caused by voltage surges in service. It tests each turn, coil, and phase group of the windings for adequate insulation strength to withstand the "steep front" high-voltage surges of actual service. First developed and applied by G.E., it's one of the production tests which all Tri-Clad motors must pass as they come off our production lines. — General Electric Company, Schenectady, N. Y.



GENERAL  **ELECTRIC**

Each week 192,000 G-E employees purchase more than a million dollars' worth of War Bonds.

TRI/CLAD
REG. U.S. PAT. OFF.
MOTORS

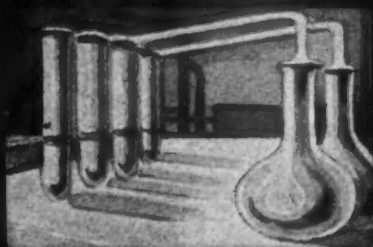
Reasons Why

Reynolds Is Outstanding
In Molded Plastics



ENGINEERING

Experienced technicians engineer your ideas all the way through design, molds and complete finish — by compression, injection, extrusion or sheet forming.



RESEARCH

Long tested and proved the Reynolds organization is always deep in research—development—planning—for post-war needs and rapid reconversion.



FACILITIES

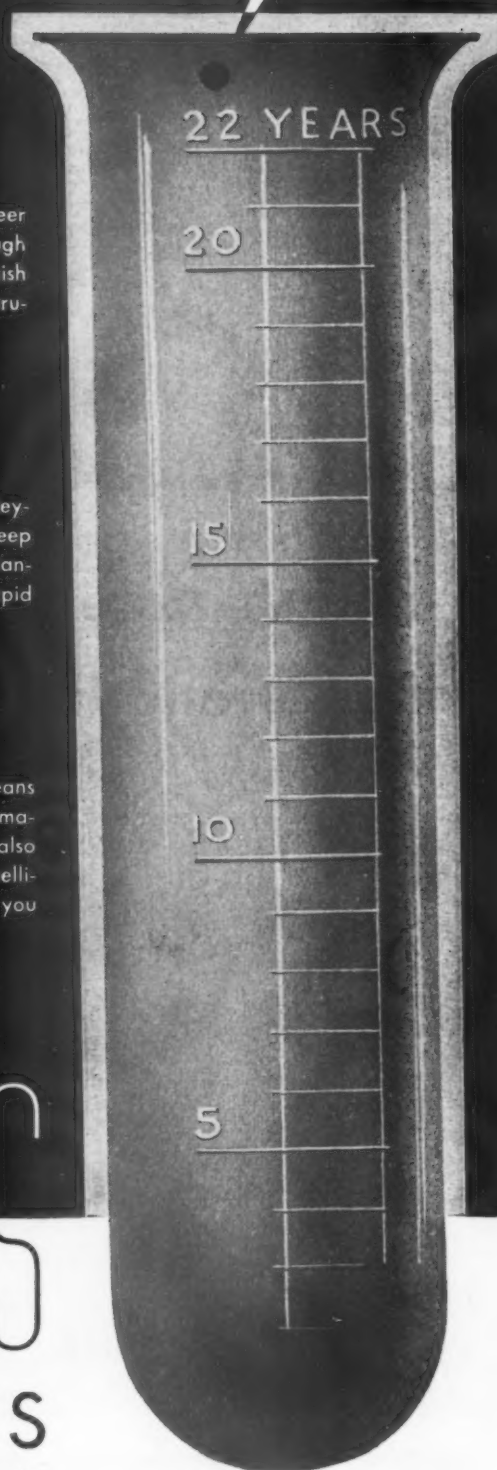
Plastic Molding by Reynolds means far more than just buildings, machinery, labor and material. It also means resourcefulness and intelligent ingenuity that will serve you well.

REYNOLDS

MOLDED PLASTICS

C A M B R I D G E , O H I O

INVEST IN WAR BONDS



DIV. OF REYNOLDS SPRING CO.
JACKSON, MICHIGAN

NEW

AVAILABLE NOW!

The new, complete, fully illustrated 1944 *Weatherhead Aviation Catalog* is yours for the asking. Write on company letterhead simply giving your name and title—no charge, of course.

Every aviation engineer, designer, purchasing agent and production executive should have this handsomely bound, 150-page Aviation Catalog just off the press. Each of the scores of parts made by the four Weatherhead plants is fully described, all parts are illustrated with diagrammed drawings and dimensional charts.



Save Time . . . Save Money . . . Save Effort . . . Write for this handy source book today!

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Look Ahead With



Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND, OHIO

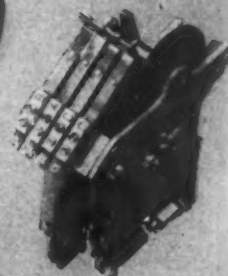
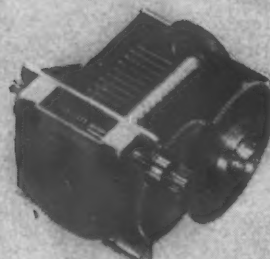
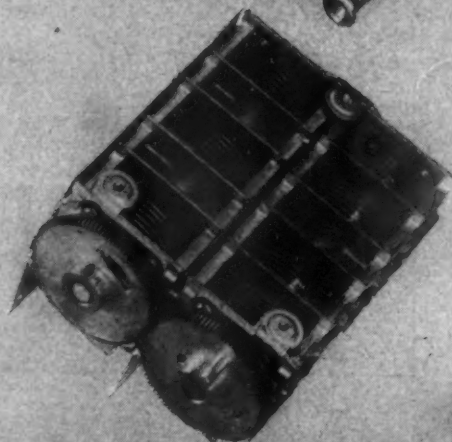
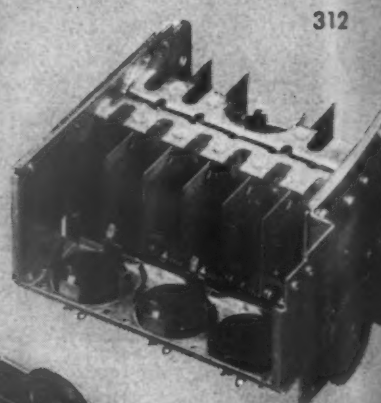
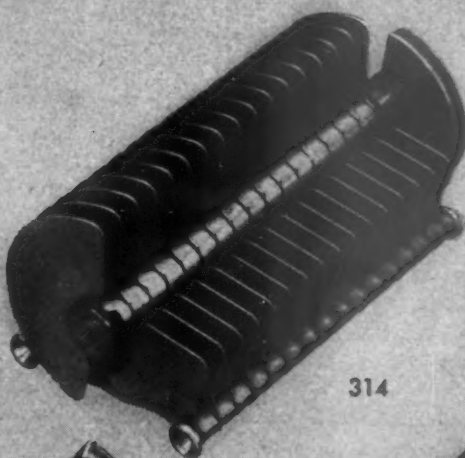
*One of the Oldest and Largest Manufacturers
of Vital Parts for the Aviation Industry*

OPEN CAPACITY

51% MORE ELECTRONIC PRODUCTION
WILL BE NEEDED IN 1944

WELL, WASHINGTON -

We Can Help!



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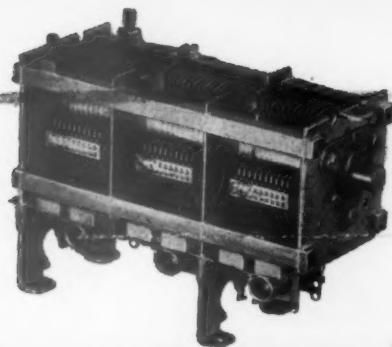
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at G.I.

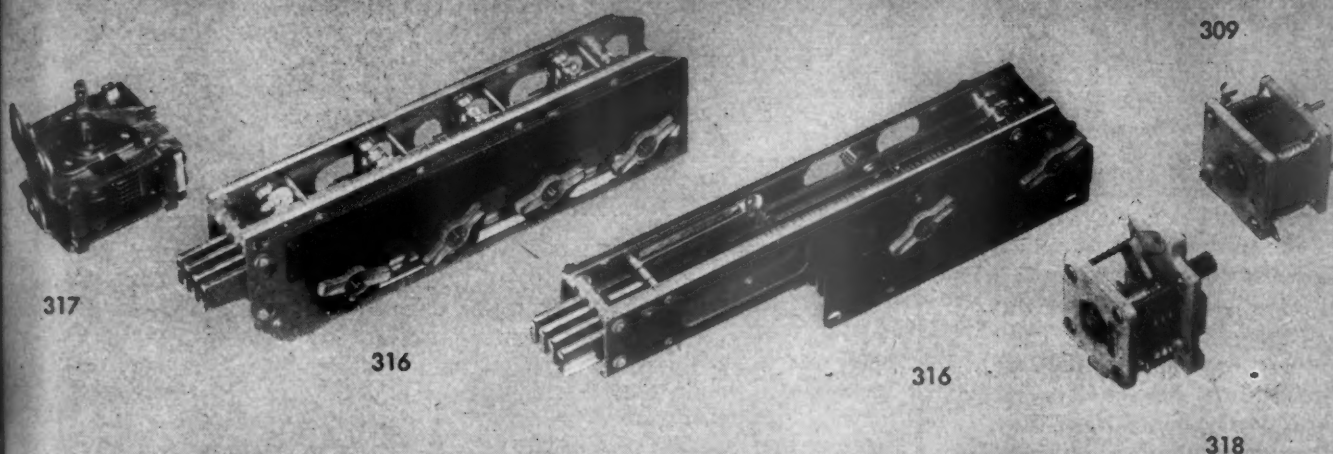


310

● A generation of experience in the mass production of precision variable condensers and more recently of automatic record changers has placed us in a position to contribute materially to the tremendously increased war requirements in the electronics field. We now have greatly expanded facilities and a remarkable system for the manufacture and assembly of precision instruments of wide variety and great complexity.

● We are ready and eager to undertake development and large scale production of the many new items in the fields of radio and radar which will utilize the special techniques we have perfected in the volume output of such items as variable condensers, automatic timing mechanisms, wired assemblies, etc.

● To insure '44 production goals we ask that you send your inquiry immediately.



GENERAL

The first in our industry to be so honored



INSTRUMENT CORPORATION

829 NEWARK AVENUE, ELIZABETH 3, N. J.



PROTECTS

C/R mallets and hammers permit forceful, effective blows without battering, scarring or marring. They protect fine finishes, delicate insulation, hardened parts and costly machinery. They far outlast other mallets, hold a true striking face and, because they absorb recoil, they are less fatiguing on continuous use operations (as pounding in winding, assembly work, etc.). Speed production—reduce spoilage. All sizes. Weighted or un-weighted. Hammers take replaceable insert faces.

Write for Catalog Sheets

CHICAGO *Rawhide* MFG. CO.
1294 ELSTON AVE. ★ CHICAGO, ILLINOIS

F.O.B. *Philosophy of buying*

ONE of the most interesting editorials to come to our attention in many months is the statement of the Knoxville (Tenn.) *Journal* anent the recent proposal to raise the salaries of the various department heads and directors in the city administration. Our personal knowledge of the Knoxville political situation is negligible, and we have no basis for judging the individual merits of the cases under review, but this editorial goes beyond cases to a generalization that reveals a fine appreciation of the purchasing job and of a competent purchasing man. Says the *Journal*:

There can be nothing but appreciation for the generous impulse which prompts City Manager George Dempster to propose to Council that the salaries of all the higher-paid members of his official families shall be increased. Generosity is an admirable characteristic in any private citizen or public official.

It is a thing one is reluctant to say, but it must also be said in fairness that it is upon grounds of generosity only that most people will bring themselves to approve the proposal made. For, with the exception of the increase proposed for Purchasing Agent Wiley Thomas, whose salary is actually out of line with his responsibilities, there appears to be no justification whatever for the increases planned.

The writer then goes on, name by name, to examine seven of the positions involved in this proposal and the qualifications of the incumbent, and in each case registers his unqualified opinion that the salary increases are unwarranted upon the basis of the situation. And then he comes around, once more, to the case of the Purchasing Agent.

Few will find fault with the increase proposed for Purchasing Agent Wiley Thomas whose responsibilities, discharged under a succession of administrations, thoroughly justify the larger salary. As every business man knows, a smart, honest purchasing agent can be worth hundreds of thousands of dollars to the concern for which he works, no matter if it is a private or public business.

We like that editorial not only because it is on "our side"; not only because it champions a position that is more often the target of brickbats rather than bouquets; not only because we know and like Wiley Thomas and have long respected

him as an able, high type practitioner in the purchasing field. We like it because of its objective and businesslike approach to the analysis of jobs and of men; because it has the courage to break away from the straight ticket and party line policies too often characterizing discussions of public office; and because of its gracious and forthright commendation of a man who has an important responsibility to perform in the public interest, and who has modestly and competently met that responsibility "under a succession of administrations."

WITH characteristic directness Charles F. Kettering states the reason why he has a keen personal interest in planning for the future. He expects to spend the rest of his life in the future, and therefore wants to be reasonably sure of what kind of a future it's going to be.

SOMEWHAT similar in principle is the policy of the Pennsylvania Salt Mfg. Co., which has turned over its post-war planning to men under 35. Two reasons are given: (1) the younger men may be expected to be more daring and imaginative in their plans, and (2) they are the ones who will have to execute the plans anyway.

CONGRESS and the War Production Board are not the only august bodies that have wrestled vainly with the problem of a uniform cancellation clause. The subject came up at the May 1943, convention of the National Association of Purchasing Agents and a well qualified committee—Tom Jolly, Al Hayes, and Bob Swanton—was appointed to consider the possibilities of composing a simple clause that would be equitable and fair to all parties. The committee report, presented at the Executive Committee meeting in Cleveland and accepted "with orchids", provides an illuminating footnote to the whole termination muddle:

"The committee started to work with great enthusiasm and soon composed an almost perfect clause. It was brief. It was clear, fair to both parties, and the intent was unmistakable. The only fault was that COST was undefined, and these three great brains suffered and toiled to no avail. They simply could not define this little four-letter word.

"Much abashed, they submitted the problem to the National Association of Cost Accountants and to the Controllers' Institute. Neither of these great groups of cost accounting experts could define the word, and stated quite frankly that no one in the world could properly describe those things which constituted costs in any language or in any number of words.

"Two corporation lawyers who were consulted expressed the thought that cost should be defined as 'fair and reasonable'. When it was pointed out to them that all parties were not likely to agree on what was fair and reasonable and that such language would inevitably lead to lawsuits, they smiled sweetly and opined that even lawyers had to have business.

"Your committee reluctantly reports that it is up a tree and admits with a very red face, that it was another bum idea and requests that the committee be discharged and that older and wiser men be found to conduct the research on this project.

ILLUMINATING, also, is the report of "new business" coming before that Executive Committee session. In three successive paragraphs it is noted that:

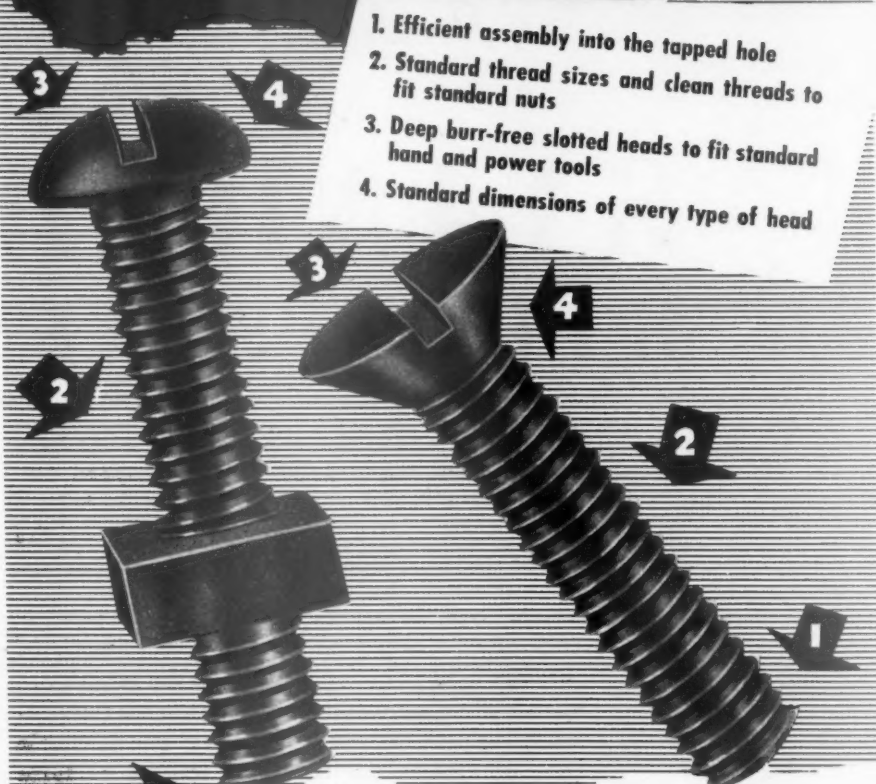
Col. C. R. Baxter, Director of the Redistribution Division of the War Production Board, has asked N.A.P.A. for any assistance and advice it may give in the handling of excess materials.

Clifton E. Mack, Director of Treasury Procurement, has asked N.A.P.A. for assistance and advice in the handling of surplus materials, which is the responsibility of the Property Utilization Division of his office.

Donald M. Nelson has asked N.A.P.A. for advice in the development of a program and procedure for handling the increasing amount of excess and surplus materials.

In short, we deduce that surplus materials are a problem, and that the practical solution of the problem is being tossed right into the collective laps of Purchasing Agents.

Why **FIT** is important for Machine Screws and Stove Bolts



1. Efficient assembly into the tapped hole
2. Standard thread sizes and clean threads to fit standard nuts
3. Deep burr-free slotted heads to fit standard hand and power tools
4. Standard dimensions of every type of head

MADE by the million, machine screws and stove bolts do important fastening jobs in a wide range of uses. Such applications depend for their economy, appearance and permanence on the fitting quality of machine screws and stove bolts. Materials meeting all of these standards are production assets.

General Screw Manufacturing Company products are specified throughout industry by Purchasing Agents aware of this fact: *Products that fit the job are easier and cheaper to use.*

General Screw Manufacturing Company Products Include: Machine Screws and Stove Bolts; Machine Screw Nuts, Carriage and Machine Bolts; Cap Screws; Cold Punched and Hot Pressed Nuts—Standard and Special.

GENERAL SCREW
Manufacturing Company
1238 W. Monroe St., Chicago 7, Ill., U. S. A.

**JOHNSON
BRONZE**

SLEEVE TYPE BEARINGS

*For your
POSTWAR
Product*

STANDARD STOCK SIZES

● Designers of products for postwar sales have an excellent opportunity now to discard outdated methods and materials and to make full use of new ideas. A step in the right direction is the use of standard stock sizes in place of specials.

Sleeve type bearings are a good example. Very often a slight change in dimensions . . . perhaps 1-32 of an inch added to the length . . . will enable a manufacturer to secure his requirements right off the shelf. This saves considerable time, eliminates the need for special patterns and tools, and provides easy replacement.

Johnson General Purpose Bronze Bearings are, in normal times, available in over 850 standard sizes. Complete stocks are carried in every section of the country. Delivery is simply a matter of hours. Cast in the alloy—S.A.E. 64—they deliver the utmost in performance and bearing life. Why not ask a Johnson Sales Engineer to show you how to save both time and money with Johnson General Purpose Bronze Bearings?

Specify . . .
**JOHNSON
GENERAL PURPOSE
BEARINGS**

SLEEVE TYPE BEARINGS

Cast Bronze Bearings
Cast Bronze Graphited
Sheet Bronze Bearings
Sheet Bronze Graphited
Bronze and Babbitt Bearings
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Self-Lubricating Bearings
Electric Motor Bearings
Automotive Bearings
Bronze Bars
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J. OHNSON

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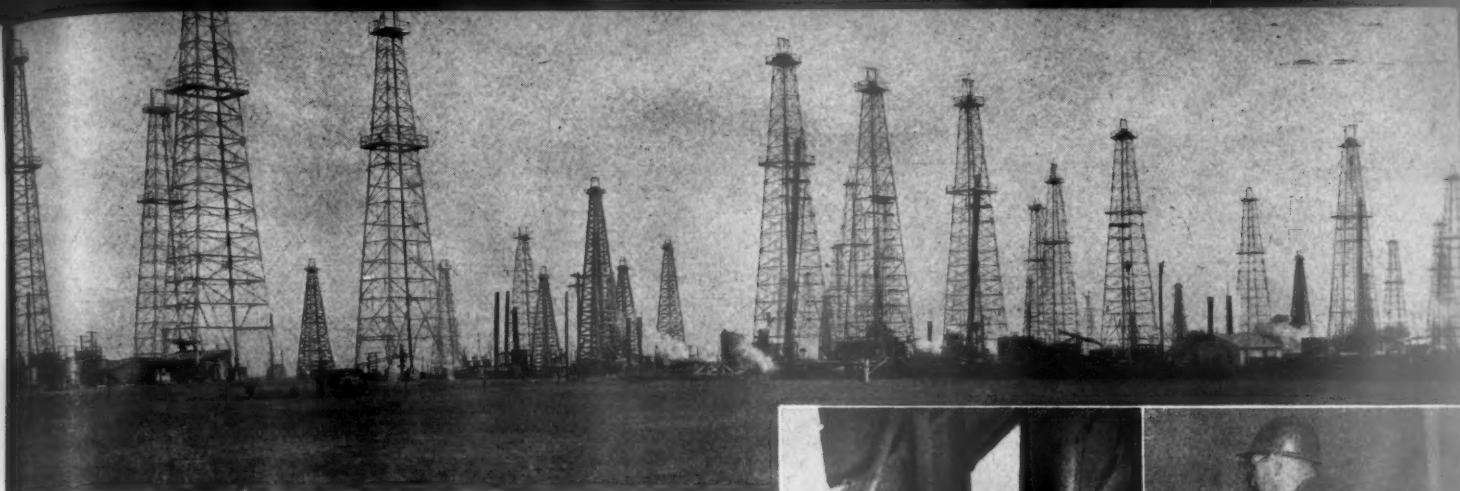
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SLEEVE
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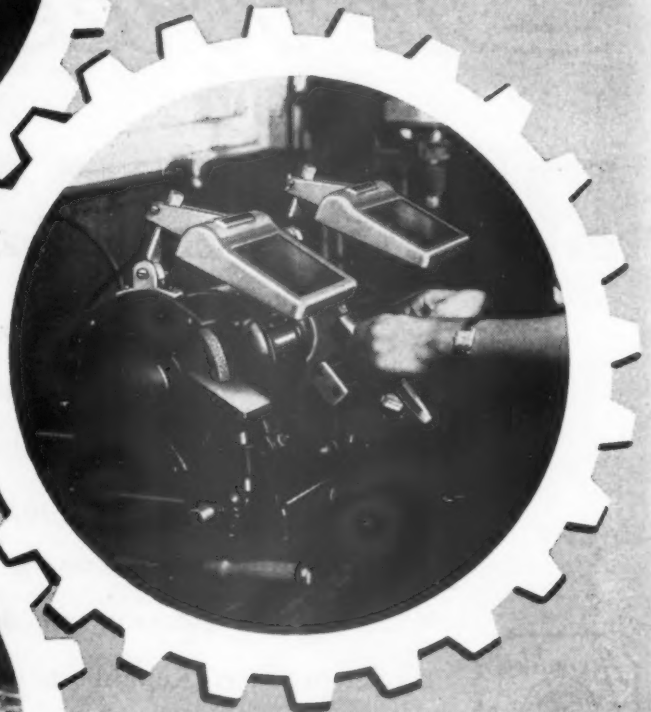
STANLEY

TRADE MARK

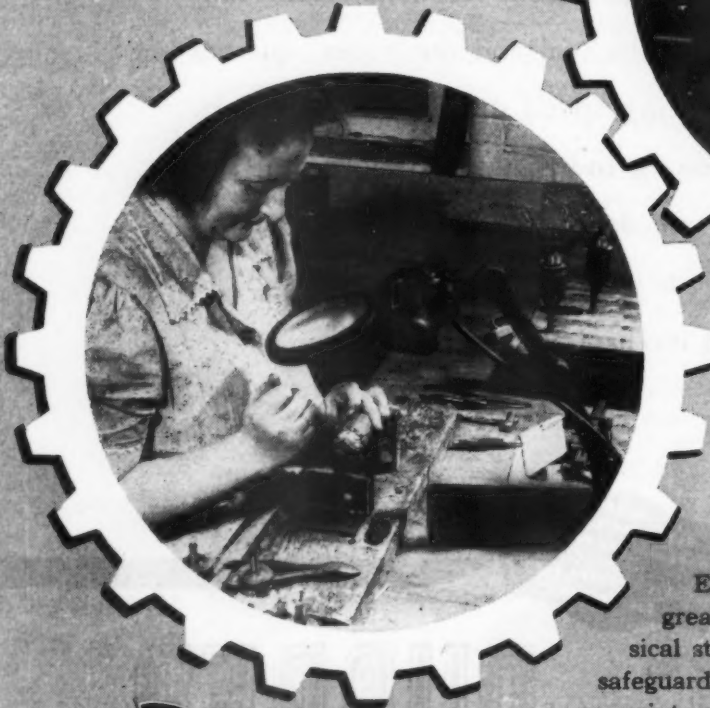


◀ Stanley Safety Saws are equipped with an approved safety guard which covers cutting edge, swinging back as saw blade advances into work. Safety switch and balanced handle are additional safeguards.

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STANLEY ELECTRIC TOOLS

PURCHASING PREVIEWS

From the Washington office of

PURCHASING

National Press Building
Washington, D. C.

April 3, 1944

For Purchasing Executives:

STAGE IS BEING SET FOR PARTIAL RECONVERSION OF INDUSTRY to fairly large scale consumer goods production at the conclusion of the war in Europe. Mistaken ideas are circulating that there will be consumer durables production with the European war still in progress—but although labor may be ample in some communities, even to the extent of some unemployment, there will not be sufficient labor surpluses to start up major production assembly lines.

The current speculation on early reconversion has been heightened by the increasing number of cutbacks in contracts. These cutbacks, however, are predicated not on termination of hostilities but on the fact that the Army now has purchased the major portion of much of the equipment it needs, and is operating on a replacement basis. Design changes and change in battle conditions also account for cutbacks.

Present volume of cutbacks will continue to release plant capacity, materials and some labor. Prospect in regard to released plant capacity is for some plants to remain idle or partially idle.

Materials released by cutbacks will be used to go back to standard models on essential consumer goods. WPB has been more liberal in its allocation of steel, copper and aluminum to essential civilian production. Instead of using up this excess to produce more victory model units of consumer durables, the emphasis will be on returning to the output of the sturdier and more practical standard models.

Shortage of copper forced use of cast iron as a substitute on many items. Where the iron has proved unsatisfactory, excess copper and brass will be allocated to permit production of the pre-war item. This return to standard models will be gradual. In many instances, such policy has the dual advantage of providing more durable goods, while at the same time conserving labor. Working time on metal is less than on wood substitutes—and metal is now in better supply than wood.

There will be a loosening up of restrictions before European success is accomplished—but no large scale consumer durable goods production will be possible. Reason is two-fold:

1. Labor. . . . There may be surplus labor in some stages of processing, but most consumer durables draw on some labor skills that are short. Further, the military is opposed to diverting labor, because of the obvious psychological effect on workers in war industry, who might seek to insure post-war employment by switching to peace production jobs.

2. Components. . . . Most consumer durable goods require fractional horsepower motors, bearings, switches and valves. Of these there is no excess.

When the European war is over, on the basis that the war against Japan is still ahead, there will be a sharp scaling down of military requirements. A substantial segment of industry will have to continue full scale output of war goods, while the remainder of industry converts to normal production lines.

* * *

PROBLEM OF KEEPING SOME MANUFACTURERS at full scale war production while their competitors return to normal output has three facets:

1. Earlier return to civilian output will give manufacturer advantage of building up distributive and sales outlets.

2. Producer of peacetime product will be able to stabilize labor force.

3. Problem of adjusting work so that cost of peacetime product is not too highly inflated.

National Service legislation has been visualized as an easy solution to all the labor ills during the reconversion period. In fact it appears to oversimplify this phase of the problem.

WPB Chairman Nelson has developed a compact program for reconversion as follows:

1. Office of Civilian Requirements list of commodities in the order of their essentiality will determine order in which consumer goods production will be resumed.

2. Selection of firms to be permitted to resume civilian production will not take into account competitive position of the individual firm. Chairman Nelson has stated that "If, without interference with the war effort, we can give a manufacturer in a non-critical manpower area materials and parts to resume production of things the civilian economy needs, I think it is to the public interest that we do so without waiting until another concern in a critical area is permitted to resume production."

3. While competitive position of companies in a particular line will not be taken into account in reconverting, Chairman Nelson proposes to protect all segments of an industry against outside competition until supply of materials and components is easy. In other words, new competition seeking to enter a field of manufacture would have to wait until the manufacturers in that field had resumed their normal activities.

Chairman Nelson proposes to change WPB structure so that this agency can shepherd industry through the reconversion period. His policy is a mixture of Government paternalism seeking to foster free enterprise. He does not favor any quick discard of Government controls.

* * *

SURPLUS PROPERTY POLICY BOARD, established in accordance with the recommendation of Bernard M. Baruch, has begun to function. It appears that two lines of policy will be established: one to govern disposal of the current surpluses which, while large, are admittedly nominal in comparison with the surpluses that will appear at later stages of the war economy; the other will be to dispose of these huge future surpluses.

Focal agency for redistribution of surpluses will be the Procurement Division of the Treasury. Reason for this choice is that in addition to having the experience in handling large surpluses, the Procurement Division also has a field force that can handle redistribution.

The current approach to disposal of such surpluses as develop is to take advantage of the fact that there still is a seller's market, and on this account the Government will seek to get ceiling or near ceiling prices on its sales.

The Government will seek to introduce the surpluses at the stage of distribution most suitable to handle the goods. This stage will likely be determined through consultation with the industry concerned, giving considerable voice to the trade association of the industry.

Prices will be established at or near the levels which the factor in the trade has been paying. If the surplus is to be returned to the manufacturer, the price would take into account any cost of handling, repacking, etc., of the manufacturer, and also a fair profit to the manufacturer. This same policy would apply if the surplus were sold to a distributor or even retailer—in each case giving the buyer a working margin sufficient to make the handling of surpluses attractive.

Example of this approach was the sale of a large quantity of World War I harness by the Procurement Division. The harness was sold to the manufacturers in the field at a price that would permit them to remove the military trappings, and put the harness in condition for the civilian market, at a profit margin comparable to the normal profit in the industry.

It is likely that a percentage of the surplus goods will be allocated for sale on the export markets to provide some goods for Latin America and other nations with which we trade.

This overall policy to get ceiling prices when possible will give way to a more expedient program when the volume of surpluses shows that a buyer's market is developing. It is at this stage that the crisis of surplus disposal will develop. Objective is to cushion this crisis by liquidating and redistributing surpluses as they appear.

Are your shipping packs designed to protect goods will from shipping point to point of destination?

| | |
|-----|----|
| YES | NO |
|-----|----|

Are you certain that there is no waste material and weight in your cartons, boxes, crates, etc. . . . ?

| | |
|-----|----|
| YES | NO |
|-----|----|

Have you investigated the Acme "Skid-Load" method?

| | |
|-----|----|
| YES | NO |
|-----|----|

Have you investigated the Acme "Unit-Load" method?

| | |
|-----|----|
| YES | NO |
|-----|----|

SHIPPING QUIZ

ANSWER YES OR NO

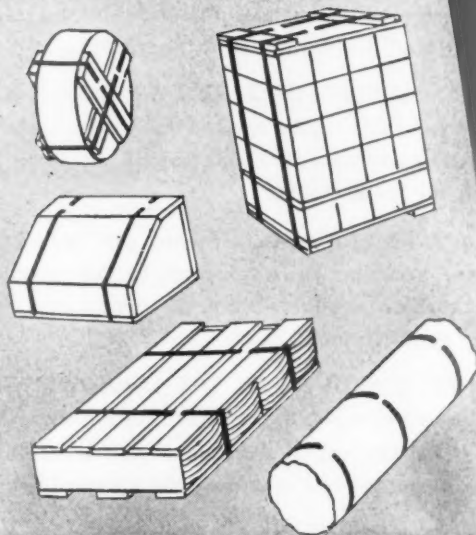
Here's Your Answer
TO PERFECTION IN SHIPPING-
PROTECTION—"BOUND TO GET THERE"



Every product needs a periodical "check-up" to see that your shipments are "Bound To Get There" safer — that your product is packed to fight damage and arrive "right side up with care."

If your answer is "yes" to all of these questions—you can pass your shipping examination with flying colors—If you haven't all the answers — call for a "check-up" by Acme technical men—there is no obligation.

Acme Steelstrap



ACME STEEL CO
CHICAGO

ACME STEEL COMPANY

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"dual-role"

PERFORMANCE

saved 3 months delivery time

DISTRIBUTOR

SUPPLIER

CAN WE CUT ELECTRICAL
TIME-LAGS FOR *You?*

A CHICAGO WAR PLANT was badly in need of a new fire alarm system. The order was placed "via Graybar" for earliest possible delivery.

OUR SUPPLIER OF ALARM SYSTEMS reported a snag. Special wire needed to produce the system was unavailable. It could not be obtained for this job for three months.

BACK IN CHICAGO, Graybar got busy in a new role. Working as a supplier to our supplier, we located an available stock of wire of slightly different specifications.

ONCE APPROVED BY THE UNDERWRITERS, the alternate wire was expressed to the fire-alarm builder. It permitted him to get under way immediately on the order for our customer, the Chicago war plant.

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PURCHASING

APRIL, 1944 CONTENTS



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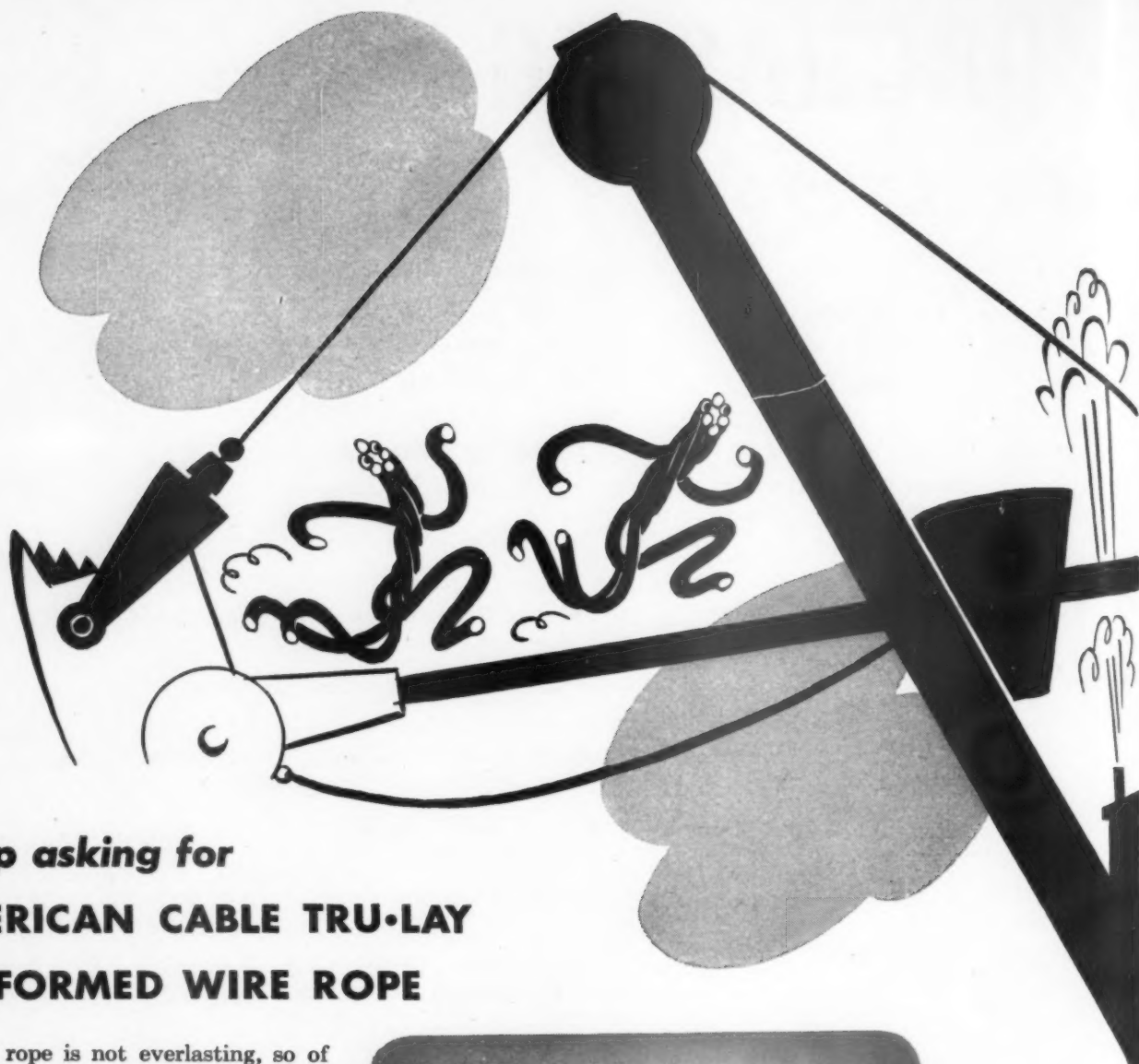


PURCHASING is an independent journal not the official organ of any association. It is the only publication of national scope devoted exclusively to the interests and problems of the purchasing executive in industry and government. Established 1915 as "The Purchasing Agent." Consolidated with "The Executive Purchaser."

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• Wire rope is not everlasting, so of course you have to replace it occasionally. With American Cable **TRU-LAY** Preformed the "occasion" is much less frequent because it invariably lasts longer. But when you *do* have to replace your ropes **TRU-LAY** handles much easier—it is much more flexible—it is far faster to install. This gets machines back into production sooner; saves man hours; saves money.

This is just *one* of the advantages built into American Cable **TRU-LAY** Preformed—at the mill. Just *one* of the reasons why **TRU-LAY** Preformed wire rope is preferred by so many operators. Specify it for your next line. It will steady your machine production; save you time and prevent accidents.

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to install!**

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the Armed
Forces take
so much of our
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HAZARDS FOR BUYERS IN THE NEW TAX LAW

THE Revenue Act of 1943, which is now law, provides for an end to renegotiation, but substitutes the power of "repricing" to accomplish the same end, and perhaps more. Contracting agencies of the government services are empowered to fix new prices on old contracts—renegotiation of prices instead of profits—and in the event of a disagreement, the contractor's only recourse is to sue.

What has not been so generally comprehended is that the Act extends this authority to the pricing of subcontracts as well. On the average of all war contracts to date, 51 cents of every dollar of the prime contractor's price is spent by his Purchasing Agents in the procurement of materials, parts and supplies. Heretofore it has been accepted, as a starting point in cost accounting, that the prices paid by the contractor automatically become an element of his costs. From here in, those prices are subject to review and to repricing by the service procurement agencies.

There can be little doubt that the Army proposes to exercise its new powers. Repricing and close pricing are a part of the buying policy, and the machinery has been set up for detailed interchange of price information, upon which the industrial Purchasing Agents' performance is to be judged, and possibly revised.

Without challenging this policy as a move in the national interest, as an anti-inflationary measure, and as a check against premium prices, careless or incompetent buying, it is nevertheless important to analyze its effect upon the buyer's position.

Purchasing Agents are still directly responsible to their employers, and not to the government, and they are specifically authorized to make contracts for which their companies are responsible. Under the new plan, their acts are subject to the policy of a government procurement agency rather than to company policy, and the important price factor of their contracts can be overruled by repricing. Interchange of price information has always been considered unethical, and has been definitely frowned upon by Purchasing Agents' Associations. Collusive buying is just as pernicious and contrary to public interest as collusive bidding and selling. Price alone is no adequate measure of a good purchase; there are many qualifying factors, and purchasing science is founded upon discriminating judgment and balance, taking all these factors into account.

Regardless of economic factors, this Act sets the stage for a highly autocratic buyers' market, with so many unhealthy aspects that buyers will welcome it even less than sellers. The best answer, of course, is keen, competent pre-war buying that can justify its own decisions in respect to price as well as other factors, and an end to the wartime philosophy of careless pricing on the theory that, in the long run, Uncle Sam would foot the bill. This much, both management and government have a right to demand. Beyond that, the road is fraught with serious danger.

Stuart F. Neimark



When every second *counts*

Through the windows of the waistline tower in any big railroad switch yard you see an unending stream of traffic pouring in both directions. The senior towerman may supervise close to two hundred moves in a single hour. At the rate of three per minute he must visualize every track, every siding, every spur and derail . . . he must make every second count.

Troops must be moved to embarkation ports . . . guns and ammunition transported to our armed forces . . . fuel oil for ships and gasoline for our air forces must be delivered without delay.

Increasing war demands threaten a critical situation for freight transportation, especially tank cars. You can help to avert it by speeding the turn-around of these cars . . . by making every second count.

COLUMBIA CHEMICALS



PITTSBURGH PLATE GLASS COMPANY
COLUMBIA CHEMICAL DIVISION

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CHICAGO • BOSTON • ST. LOUIS • PITTSBURGH • NEW YORK • CINCINNATI
CLEVELAND • MINNEAPOLIS • PHILADELPHIA • CHARLOTTE

COLUMBIA SPOTLIGHT

1,000 U. S. BOMBERS over Berlin may consume 1,200,000 gallons of gasoline—the capacity of a train of 120 tank cars. A fighter plane uses 100 gallons of gasoline in an hour . . . our big four-engine bombers eat up just twice as much. And a single mechanized division in action may use two tank cars of fuel per hour. No wonder these cars are at a premium!



THE INCREASING TEMPO of the war in the Pacific and the absence of pipe lines to our west coast are placing additional burdens on the rail transportation by tank car of fuel oil and gasoline destined for this theater. Each American soldier overseas requires an average of 50 gallons of petroleum products per week. The delivery of supplies alone involves enormous quantities of fuel . . . each Liberty Ship burns about 40 tank cars of fuel oil for the Australasia round trip.



COLUMBIA TANK CARS are working overtime, too, supplying the Liquid Caustic Soda and Liquid Chlorine essential in the manufacture of so many war materials. Incidentally, Columbia introduced the special car which first made practical the transportation of 73% Liquid Caustic Soda without metallic contamination. Principal features of this car are the heavy insulation which keeps the liquor from freezing and the special lining. The use of 73% Liquid Caustic Soda has enabled Columbia customers to save many thousands of dollars.



THANKS to Columbia customers for their splendid co-operation in handling tank cars which—combined with Columbia's stepped-up loading schedules, increased supervision and expediting of equipment—resulted in a 1943 turn-around performance that was excellent in view of transportation conditions. We know that all customers will co-operate with us toward a still better record so necessary to the war effort.



COLUMBIA CHEMICALS include Soda Ash, Caustic Soda, Sodium Bicarbonate, Liquid Chlorine, Silene EF (Hydrated Calcium Silicate) Calcium Chloride, Soda Briquettes, Modified Sodas, Caustic Ash, Phosflake, Calcene T (Precipitated Calcium Carbonate) and Calcium Hypochlorite.

HIGHLIGHTS

A brief summary of outstanding features of timely interest and importance in this issue, to conserve the time of busy readers



In many lines, deliveries are getting easier and shipments that formerly required the closest sort of follow-up are being received far in advance of specified delivery dates. This is not an unmixed blessing, and it sets the stage for serious complications and loss in the event of a contract termination. It calls for a new technique—**Expediting in Reverse**. Turn to the article on page 81 to learn how some far-sighted buyers are meeting this problem.

Are you having trouble in **Getting Termination Claims** from subcontractors promptly and in a form that will satisfy the contracting officer in making a settlement? On page 90 William A. Walter describes an analysis form that will help the small contractor in preparing his claim without wading through pages of government regulations.

For more than two years, the Purchasing Agent's job has been largely a case of **Doing the Impossible**. On page 75 W. E. Cummin discusses our greatest national asset—American ingenuity—and how it has helped to overcome seemingly insurmountable obstacles and to meet the extraordinary demands of wartime production and procurement.

Sales Contract Law has been radically altered by recent interpretations and decisions of the higher courts, which have reversed the findings of the lower courts in a surprising number of cases. To be on safe legal ground, the buyer must follow the rulings of the higher authority. Leo T. Parker reviews a number of the more significant decisions on page 115.



Renegotiation is out, but **Repricing** is in, as a factor of government purchasing policy. Perhaps you didn't notice that section in the new Tax Law, but it's there and it's loaded with dynamite for PA's and for purchasing, affecting their responsibility, authority, policy, procedure, and ethics. Read the editorial on page 71.

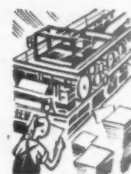
In the hurly-burly of crowded, shell-torn London, with an invasion army to equip and a war to be won, our Army procurement officers and British industrial PA's took time out for a practical and stimulating **Wartime**

Purchasing Conference. A former N.A.P.A. Vice President was there. You'll be interested in Col. Allen's report, on page 100.

The Washington Letter, on page 65, gives a preview of current opinion and policies in official circles on two topics of vital interest and importance to every purchasing man—the **Reconversion of Industry** to the production of civilian goods, and the method of handling **Surplus Property**. Your plans and policies will be dependent on government policies.

A simple and efficient **Purchasing System** at Delta Mfg. Co. has successfully maintained the flow of materials and kept them under close control without the use of purchase requisitions. As a matter of fact, the production department is the last to be concerned about material requirements. The article on page 83 tells how it is done.

To what extent is it economical and practicable for a purchasing department to operate a **Private Printing Plant**? The story on page 221 gives the experience of one Purchasing Agent with a three-press shop for printed forms and stationery, and what he has found out about costs, service and convenience.



Classifying Commodities for purposes of procurement, storage, accounting, and issue, is a science in itself, and one which every purchasing man must apply to the requirements of his own plant. Dr. E. V. Wills discusses the underlying principles on page 102, and explains the Federal Standard Stock Catalog, which is the largest and most complete project of its kind.

Do your plant men consider value in specifying the tools and materials they want? T. A. Morris tells how this is accomplished at International Harvester Company by making **Purchase Cost Data** available to operating men and inviting their cooperation toward more efficient selection and purchase. His article appears on page 188.

Charles Ford, the philosopher of purchasing, offers a time-tested formula for dealing with slow moving inventories and the accumulation of obsolete or idle equipment—**Sell and Repent!** Turn to page 107.



Intricate Shapes

Quickly Cut by Flame

Short Cuts and Economies Developed . . . Time Saved

Many manufacturers are revolutionizing their products, saving time and effecting many economies by using strong rolled steel, flame-cut to exact size and shape. No matter how intricate, Ryerson flame-cutting equipment produces neat accurate work—and hundreds or thousands of identical pieces are turned out quickly.

Whenever you need flame-cutting service, call Ryerson. You'll get immediate action—prompt delivery. If there is any question, we will review your

specifications or estimate any job you have at hand. Get in touch with the nearest Ryerson plant.

Joseph T. Ryerson & Son, Inc., Steel-Service plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Pittsburgh, Philadelphia, Jersey City.

RYERSON

SOME months ago, one of the leading business advisory services published a slogan they had found hanging on the wall of a manufacturer's office. Just about every top executive in the country saw it, and about 80% of them called it rather pointedly to the attention of their Purchasing Agents:

"The difficult we do immediately. The impossible takes a little longer."

We Americans are known the world over for our ingenuity, and in the stress of this terrific war effort it is being put to the test. A company has an order requiring the daily use of a thousand specially made gadgets. There's only one manufacturer of this gadget, and he reports a maximum production capacity of forty units a day. He doesn't have the material, equipment, facilities nor manpower to produce more. Impossible? The Purchasing Agent can't accept that answer. He knows that nothing is impossible. The impossible simply takes a little longer.

"Where There's A Will"

So we round up our production man and visit the would-be supplier of gadgets that are not possible for him to make in sufficient quantity for our need. We describe the product in which it is to be used, its importance to the war effort, and how his gadget is an essential part of the whole. We remind him that there's a war going on, and that every one of us is an active participant in the all-out program. In this participation, we remark how fortunate we are, as individuals, that we are not in uniform, serving as targets for the little yellow "Sons of Heaven". So, we are here to work together in finding some method, any method, to step up production from forty to a thousand per day.

Believe it or not, in a surprisingly short time a method of production is found whereby the impossible thousand per day can be made. And instead of costing us \$0.9475 per each, the new method is so efficient that the gadget can now be sold at \$0.275 per each, at a profit satisfactory to the supplier.

The impossible has been accomplished. Time schedules are being met, and important cost savings are realized. That is American ingenuity in action.

But these accomplishments—the triumphs of ingenuity over the impossible—do not just happen. They are the result of intense pressure—



DOING THE IMPOSSIBLE

**It isn't easy and it takes a little longer, but
American ingenuity finds the answers**

By W. E. CUMMIN

Purchasing Agent
White Laboratories, Inc.

SIGN IN A GENERAL MOTORS PLANT

According to the theory of aerodynamics, and as may be readily demonstrated through wind tunnel experiments, the bumblebee is unable to fly. This is because the size, weight and shape of his body in relation to total wingspread make flying impossible.

But the bumblebee, being ignorant of these scientific truths, goes ahead and flies anyway—and makes a little honey every day.

the urgent necessities of the times, and the constant pressure by top management on every executive and department head, but particularly on production and procurement.

The first quarter of 1944 developed an acute shortage of wood and wood products. It was a real shortage. It reflected itself particularly in paper and boxboard products of every description—bonds, newsprint, towels, toilet tissue, and especially in the materials for folding, corrugated, and solid fibre containers. The paper boxes and cartons essential for the safe delivery of an endless range of other products became harder and harder to get.

One manufacturer suddenly needed a total of one million set-up boxes, one million folding cartons, and several thousand corrugated containers to fill an important rush order. Delivery requirements on all three items—two weeks! Impossible? Could be!

The Purchasing Agent was handed the quantities, sizes and specifications. It was his job to get those containers, exactly as wanted and when wanted. That was a man-sized assignment. It was accomplished, and on time. It had to be. How?

Mr. P. A. went to the nearest large manufacturer of set-up boxes. Normally he didn't use set-ups, and his only contact with this concern had been a few pre-war calls to learn if there were any requirements in that line. He knew that no supplier in this field was taking on any new accounts, and that they were from three to six months behind schedule in deliveries to their regular trade. The gist of the conversa-

tion is both interesting and educational, and is quoted, in substance, as follows:

P. A.: "Mr. X, we have an order for essential materials that makes it necessary for us to get one million set-up boxes, made to specification, within two weeks. It is rather an unusual box, difficult to make, and it must be top quality. We haven't any priority except the AA3 under MRO, and we know that isn't much good. I don't expect you to undertake this order, not because you lack the ability, but because I know you are jammed to the ears with business and it would be unfair for me to impose on you. What I do want from you is guidance and information. I realize that there are mighty few boxmakers in this part of the country who are as capable as you are to turn out a first rate job. So I've come to headquarters—to you—to find out where I can take my troubles. I have here the names of three companies that look to me like the best bets. Which of these, in your opinion, could do the best job for me?"

Manufacturer: "Why in hell go to them? We can handle it for you."

And so another impossible job was accomplished, by taking a little longer way around.

Call it purchasing technique or sales psychology, whichever you prefer. It makes no difference. For it is the Purchasing Agent who has to do the selling today, selling the problem of his requirement, and selling his company as a desirable customer, and he must be an adept in the art. It is the buyer who has to plan his approach, to think up and use new ways and means of ac-

complishing whatever mission he is given. He is called upon to exercise American ingenuity. The impossible takes a little longer.

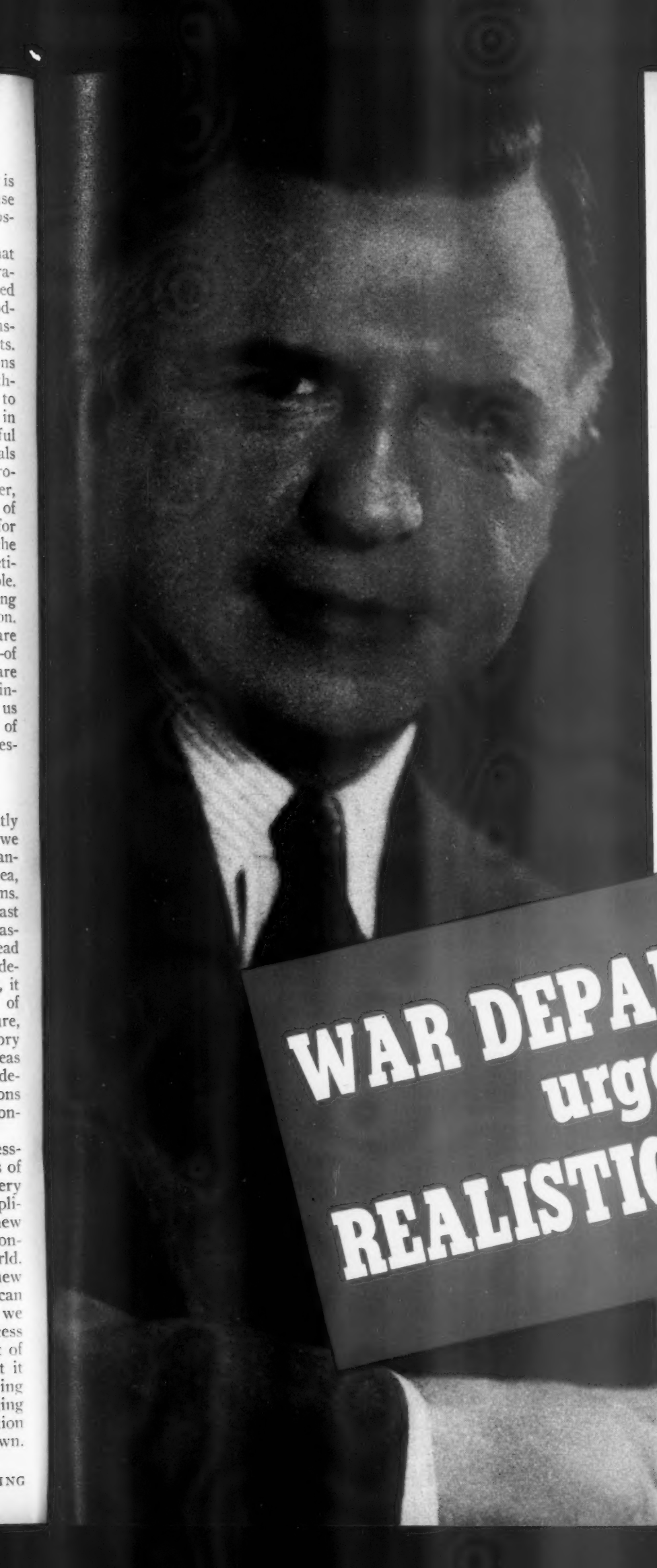
We all know of the ingenuity that originates in our research laboratories, where scientists have created new and better and cheaper products, and where they have transformed waste into useful products. We also know that these creations would be of no practical value without an alert management ready to invest its capital and capacities in new ventures, without resourceful purchasing men to make materials available, and without skilled production men to devise newer, better, and more economical methods of manufacture. That team has for years been carrying the ball on the field of free enterprise and competitive industry. They are unbeatable. They will still be in there, carrying the ball, long after this war is won.

Yes, we Purchasing Agents are a part—a very important part—of that team. And the reason we are in the line-up is because our training and experience have taught us to recognize and take advantage of new opportunities, and when necessary, to do the impossible.

Always Thinking Ahead

Another catch phrase has recently come to the fore. On every hand we are hearing about "post-war planning" as if it were a brand new idea, the solution for all our problems. Think over the cycle of the past twenty years, as it affects purchasing. Haven't we been thinking ahead all the way? Post-boom, post-depression, post-war, or post-peace, it is an elementary responsibility of purchasing to anticipate the future, to readjust our policies of inventory and procurement and our ideas about materials, to accept new developments, and to adapt the lessons of experience to ever-changing conditions.

American industry has successfully attained "impossible" quotas of war production. And in that very process it has envisioned the application of these new standards, new methods, and new materials for constructive use in the post-war world. Along with these there will be new problems, of course. But we can face them with confidence, for we know that this continuous process of doing the impossible is a part of the American character, and that it has given us the highest living standards, the shortest working hours, and the greatest production capacity the world has ever known.



The Army's contracting officer and the industrial Purchasing Agent share the responsibility for efficient procurement

AS the responsibilities of this war bear more heavily on us, there are revealed many things which could have been done earlier had we been aware beforehand of the immense benefit we would have derived from their doing.

The War Department has placed first emphasis on improving its direct buying practices, and has not stressed sufficiently one effective means of attaining its objective—the lowest price in procurements consistent with required production—by making the best possible use of industry's buying personnel and organizations. The objective is common to all of us and places a large share of the burden of attaining it on the purchasing agent. The cooperation of the purchasing agent has not been fully utilized to obtain

WAR DEPARTMENT urges REALISTIC PRICING

By Glen A. Lloyd

Assistant Director of Purchases Army Service



THE PURCHASING AGENT'S WARTIME RESPONSIBILITY

The War Department recognizes and appreciates the incalculable contributions of industry to the war program. These contributions have taken many forms—inventive genius, devotion beyond the normal call of duty, and unparalleled production records. Close cooperation between the War Department and its contractors has been essential to these accomplishments and will be even more so in the large task before us. We will never get behind us the necessity and desire for improvement. One improvement in the effectiveness of our purchases will depend upon a recognition by purchasing agents of their full responsibilities in their daily spending of huge sums of the taxpayer's money. The way in which it is spent cannot help having an important effect upon the degree of economy achieved and in turn upon the effective flow of production itself. It is only fitting to acknowledge the important role of the purchasing agent and to urge each one to do his job to the utmost of his ability, just as we are trying to do ours.

R. S. Patten

better pricing in the lower tiers of subcontracting.

A study made in 1943 showed that 51 per cent of every dollar received by the War Department's largest prime contractors is spent by them with subcontractors and suppliers. These statistics show the industrial purchasing agent to be a partner with the contracting officers of the War Department.

During normal times, the relentless competition inherent in good business practice would force tight pricing practices in the tiers of production below the prime contractor level. However, this pressure has been largely removed due to a national emergency that taxes all of our facilities to the limit. It is true, nevertheless, that the same urgency demands an acceleration, rather than a diminution, of the competitive pressure.

The necessities of a war production program call for delivery of munitions, equipment and supplies of the kinds and quality required by our armed forces. Deliveries must meet the schedules established, and prices must not unduly strain the national economy. Failure in any of these three factors can be equally disastrous.

The War Department makes no claim to perfection in its procurement program. The same problems which have been plaguing purchasing agents in industry have been experienced by our own contracting officers, and parallel mistakes have been made. There must be a continual scrutiny of values and methods to eliminate repetition of past errors.

Better pricing of procurements at all levels is therefore now highly necessary. It has also become increasingly possible of attainment, and the War Department looks to purchasing agents to assist in achieving this objective in the pricing of all procurements for which they are responsible.

In essence, such a policy calls for the application now of the high standards of purchasing which were in common practice before the war.

The stress of war introduced the profit position of the supplier as a prime measuring stick of price. This was born of the necessity of substituting some gage as a substitute for normal, healthy competition. Few producers were prepared to talk costs on items with which they had little or no experience. Shortages of supplies and components made delivery the prime consideration and minimized the im-

portance of price. The only medium for recovering excessive charges was through renegotiation, and here again the focal point of negotiation was the profit of the producing company, not the unit cost of the item. With profits a major consideration, there is little inducement to effect reduction in costs.

Successful competition is based largely on effective control of costs, and as a result a powerful pressure evolves to reduce costs of production at all stages of supply and fabrication. The application of these basic principles helped to make this nation a great industrial power, and the pressure normally supplied by competition must be created by other means in many war procurements.

The use of these competitive forces in war procurement is aimed at effectuating the following principal objectives of the War Department's pricing policy:

1. Greater production through more efficient and economical use of manpower and materials. Prices not only affect the cost of the war in terms of dollars but also have a direct bearing on the effectiveness of the use of labor, materials and productive machinery. Sound pricing encourages contractors to resist demands for wage increases and higher prices for materials, because those increases might transform a profitable contract into an unprofitable one. High prices, on the other hand, tend to relaxation of controls by contractors. The inefficiency resulting from high prices affects not only war production but also tends to cause inefficiency in civilian production and to make more difficult the rationing and price-control problems. The principal means of avoiding these dangers resulting from high prices is to put prices on as nearly a competitive basis as possible when the contracts are made.

2. Helping to hold back inflationary pressures resulting from more money available for spending, higher costs and smaller quantities of goods on the market. To carry out this objective in relation to military goods, attention must be given to actual procurements because the problems cannot be met by means of general policies and standards similar to those employed by OPA in its battle against inflation or by the Treasury in its administration of the tax on excess profits.

3. Preventing injury to morale and public indignation resulting from high prices and their effects.

4. Minimizing the cost of the war.

The War Department will effectuate the program of more realistic pricing through the direct approach of establishing higher standards of negotiation on direct business. This will naturally call for closer scrutiny, by prime contractors as well as the War Department, of prices paid to subcontractors.

Such a program cannot be totally effective without the cooperation of the purchasing agent. It will be his function in the program to initiate higher standards of negotiation in buying from suppliers and subcontractors.

Impending discontinuance of the Renegotiation Statute by the end of 1944 will require a more intensive use of renegotiation covering the period when the statute still applies, but beyond that date the responsibility for reasonable prices rests more heavily than ever on the contracting officers and the purchasing agents of industry, since the statutory backstop will be gone.

It should be added that the War

Department does take good procurement by contractors into account in renegotiation, and it may be desirable for purchasing agents to sit in on renegotiation conferences, to the end that procurement standards and performance of the company can be fully explained.

To attain higher standards of negotiation at each level of procurement, it is suggested that purchasing agents—in analysis of the cost of items which they buy—should follow procedure similar to that which has been suggested by the War Department to its contracting officers. Some of the important factors affecting price are:

Specifications. — Differences in specifications may justify or require differences in prices. The purchas-

ing agent must acquaint himself with the technical differences between the items being compared and then, with whatever expert assistance may be available, evaluate those differences in terms of money.

Size of the Order.—The factor of volume may certainly have an important influence on the comparability of prices. The unit price for 10,000 units should normally be lower than that for 2,000. On the other hand, there may be exceptions in cases of overloading, where the point of diminishing returns is reached and "creeping costs" begin to appear.

Delivery Schedules.—A contract requiring deliveries over a long period of time may have higher prices than a contract providing a shorter delivery schedule, because there are greater uncertainties and correspondingly greater risks under the longer-term agreement. The influence of such risks on prices may, of course, be affected by contract provisions for shifting the risks

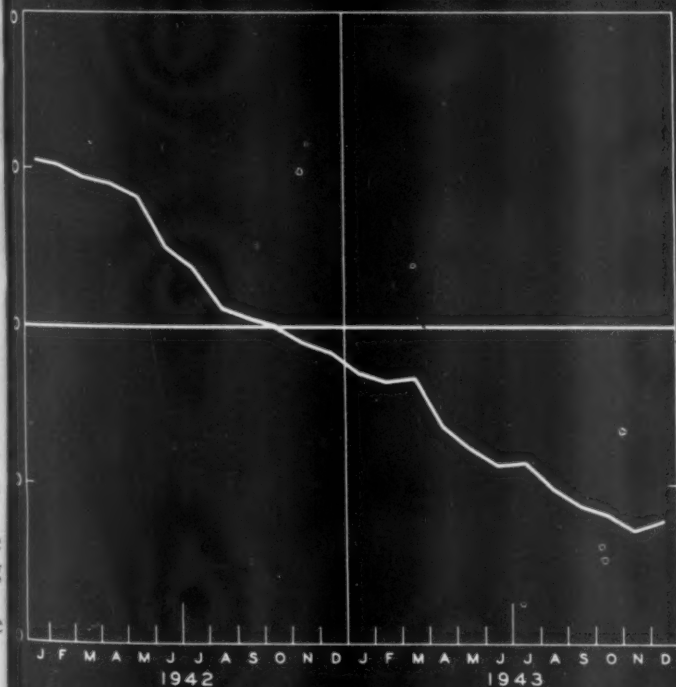
The history of War Department contract prices over the past two years is a consistent record of more effective purchasing performance from month to month.

WAR DEPARTMENT

INDEX OF CONTRACT PRICE CHANGES

1942 AND 1943

BASE: OCTOBER 1942 = 100



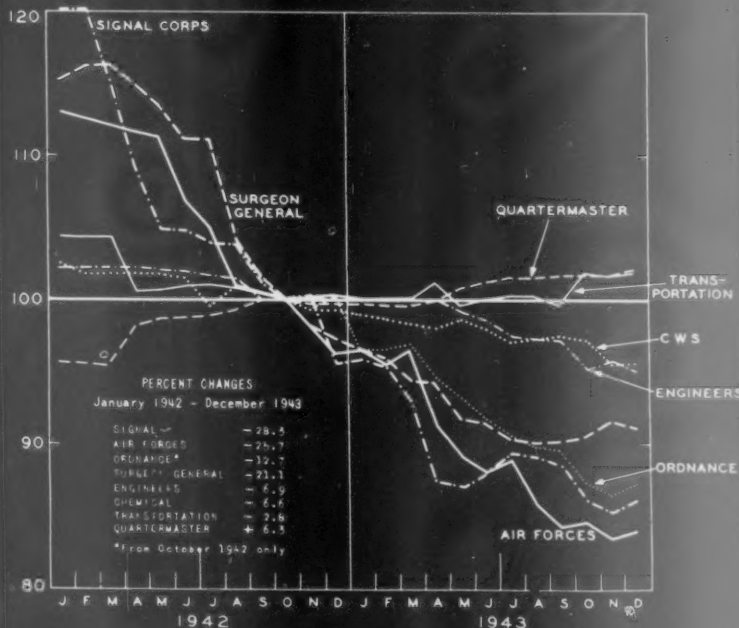
PURCHASES DIVISION
HEADQUARTERS, A S F

WAR DEPARTMENT

INDEX OF CONTRACT PRICE CHANGES OF THE TECHNICAL SERVICES AND THE ARMY AIR FORCES

1942 AND 1943

BASE: OCTOBER 1942 = 100



PURCHASES DIVISION
HEADQUARTERS, A S F



BRIGADIER GENERAL A. J. BROWNING

**Director of Purchases
Army Service Forces**

to the Government.

Government-furnished Materials and Facilities.—Where the Government supplies a contractor with either materials or productive facilities, or both, the price of that supplier is not comparable with prices of other producers who are not receiving similar treatment, unless an appropriate adjustment is made.

Financing Provisions.—Where the Government assists a producer in financing his operations, by way of advance payments, unit payments, progress payments or the like, his prices are not fairly comparable with those of other producers without an adequate adjustment.

Royalties.—An adjustment is likewise required when one producer has to pay for the use of patent rights and the others do not.

Subcontracting.—The influence of subcontracting on the comparability of prices cannot be compressed into a single generalization. In some cases it may result in prices higher than if the prime contractor had himself made the subcontracted com-

ponent. In other cases the prices may be lower. In still other cases subcontracting may not influence the price in one way or the other. The one point is certain, that it is often difficult to evaluate the effect of subcontracting on the price of a given producer.

Comparing Individual Prices.—Notwithstanding the fact that only limited conclusions can be reached from price comparisons because they merely disclose differences but do not explain them, they can often be used with good effect in obtaining prices which are fair and reasonable. Thus, where the price factors and conditions of production are substantially similar between two contracts, prices should be similar. This similarity of price factors is found usually in (1) contracts for the same item with the same contractor, and (2) contracts with different contractors for standard commercial items.

It can generally be assumed that the price for an extension of an old contract or the price in a new con-

tract covering an item in production should be no higher than the price under which deliveries are currently made. In many instances improved manufacturing techniques or increased volume will require that the new price be lower.

Notwithstanding differences in price factors, comparative prices can often be used directly to effect a price reduction. This is true because they permit the purchasing agent to inject a competitive force into his buying. No contractor derives satisfaction from being the highest price producer, and many will reduce prices simply to meet the lower price of another. Many corporations recognize that their post-war market positions will depend upon their comparative efficiency and ability to meet competition. They recognize that close prices help greatly in developing increased efficiency in production and for this reason will accept a competitive price reduction.

Comparing Price Changes.—Comparisons of individual prices are not so effective in revealing overpricing when applied to items whose manufacture is attended by wide variations in costs. These items, in the main, are those whose use is limited solely to war and which are being produced by companies having widely varying peacetime activities and corresponding variations in manufacturing facilities. For such comparisons to be direct, price factors must be identical, a condition which often does not exist.

Perhaps the most effective price comparison in use in regard to non-competitive items is that which compares the price changes of one contractor with those of another for the same or a similar item. Thus, it is assumed that even though prices are at different levels, experience in manufacture should result in price reductions by all contractors and that the rate of the reductions should be similar. To the extent that one company's price trend does not follow the decline of others, overpricing may be suspected.

The purchasing agent should not hesitate to apply the foregoing standards in making procurements. It is expected of him. In final analysis, they represent nothing more than good business practice.

This is no small responsibility that the War Department is asking the industrial purchasing agent to shoulder—but it will make an important contribution to the prosecution of the war.

EXPEDITING IN REVERSE

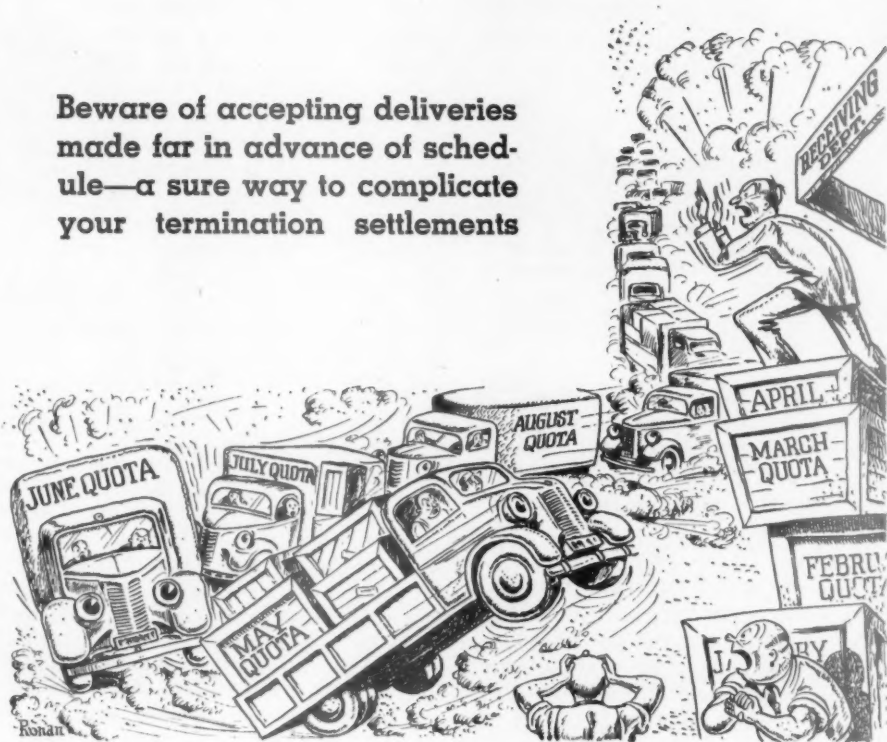
THE success of the War Production Program can be summed up in a single word—scheduling. The controls that didn't work were those that merely labelled everything "Rush" and devised a code to indicate which items were, relatively, in more of a rush than others. The controls that have worked are those which organized the whole big program in terms of a definite time-table, with quarterly and monthly quotas that permitted neither the requisitioners nor the suppliers to get very far off the beam. It was only then that we began to have a balanced supply and smooth flow of the materials and products needed. It was then that we could take a long look ahead and estimate output, item by item, with a high degree of accuracy and confidence, weighing that probable supply against the requirements of the grand strategy of war and planning accordingly. Most of the war contracts now in force were placed upon that basis.

Time-tables must be meticulously observed if they are to mean anything. Any practicable schedule should be flexible enough to permit revision and adjustment—speeding up or slowing down, flashing the red light against one part of the program so that another phase may get the signal for full speed ahead, as conditions permit and as the exigencies of war may require. But no schedule should be so elastic as to be disregarded.

It was a major responsibility and a three-year headache for Purchasing Agents to keep materials and supplies coming in on schedule time. The successful accomplishment of this task rates right up with the more highly publicized miracles of production as a factor in our achievements on the industrial front. As a matter of fact, without this procurement, the production records would have been impossible. Expediting, which was formerly compounded of a judicious mixture of persuasion and pressure, pleading and prodding, plus friendly suppliers and a high priority, becomes a science—largely a science of scheduling.

From this angle, it comes as a relief that the situation is easing

Beware of accepting deliveries made far in advance of schedule—a sure way to complicate your termination settlements



in some sectors of supply, and that the abnormal emphasis on expediting may no longer be necessary. But although conditions have changed, the fundamental principle of scheduling remains.

Most buyers, and most suppliers, are fully aware by this time that a "delivery wanted" date of June 1 doesn't mean June 15 or July 1. It is just as important to remember that June 1 doesn't mean May 1 or April 1. And again it falls to the lot of the Purchasing Agent to see that schedules are properly observed, for it is very natural that a supplier will utilize his facilities, manpower and materials, to fill the orders on his books.

Insisting that delivery schedules shall not be anticipated does not imply any attitude of complacency, nor any prediction that the end of the war is imminent. It is simply good business. It is scheduling in the true sense. Even on the assumption that a contract is to be carried through to completion and that the goods are to be used, it costs money to handle and store the deliveries up to the time of use, and to carry the larger inventory, so that material costs are higher. Capital is tied up in materials, and at prevailing volumes of orders and operations this fac-

tor may run into far greater than normal proportions. And whenever inventories are high, the usual risks of loss, damage, spoilage and obsolescence are magnified. Consequently, even at best, the premature acceptance of deliveries in anticipation of future needs must be weighed very carefully as a matter of prudent business judgment.

But the assumption of future need on a specific manufacturing program is by no means a safe premise when we are dealing with war contracts. The probability of completing such a contract without change, cutback or outright cancellation is conservatively estimated as about one chance in three. So let's tie up this situation with the No. 1 problem of management and of purchasing today—contract termination. Indeed, it is more than likely that the advance deliveries have been made possible because of some other termination, and they may have been prompted by the desire to forestall a cancellation on the order in question.

In the event of contract termination, your first instructions from the government contracting agency will be to stop work in your own plant and to stop work on the order in your suppliers' plants by

cancellation of unfilled purchase orders and agreements. Obviously it is impossible to stop production on something that has already been produced and delivered, and probably paid for. And in the light of a definitely scheduled time-table of deliveries, the re-

IMPORTANT NOTICE

DO NOT SHIP THIS ORDER BEFORE DATE SPECIFIED. WE WILL NOT MAKE PAYMENT UNTIL AFTER DATE SPECIFIED, TAKING FULL DISCOUNT PRIVILEGES. WE RESERVE THE RIGHT TO RETURN ALL MATERIAL IF SHIPPED PRIOR TO DATE SPECIFIED, SHIPPING CHARGES COLLECT.

sponsibility for materials that are in your possession on April 1, but which are not due on the order until June 1, is definitely yours and not the government's if the June 1 quota should have been cancelled.

Or look at it from another angle. When the time comes for a settlement on the termination, the regulations are very clear and specific on the point that inventories will be considered on the basis of a reasonable quantity in relation to the percentage of completion of the work in your plant, and deliveries two or three months in advance would scarcely come within that sort of calculation. If you don't happen to want the materials for your own account or on some other current contract, it is extremely doubtful whether any reimbursement can be allowed.

These conditions are a part of the contract. They protect the government as buyer, to be sure, but they also enable the contractor to protect his own position.

Furthermore, the CMP orders are still in effect, restricting the amount of permissible inventory. It is more than likely that premature deliveries will send inventories beyond that limit, with the result that the buyer is not only left "holding the bag" but is in a vulnerable position for CMP violation.

There's still another important point to consider. One of our big post-war problems is that of surplus. Anything that tends, even remotely, to build up a surplus, ought to be discouraged, and there's economic dynamite in running ahead of the time-table. That's not a theoretic generalization, and there is a good selfish reason to enlist the cooperation of every buyer in holding down

stocks that may become surplus. Not only because it is less pleasant and less profitable to operate in a sick economy, but because that condition will directly affect every one concerned. Surplus stocks will hurt the producer's market. They will hurt the company that holds those stocks even more.

So the time has come for expediting in reverse, impressing the supplier with the fact that June 1 doesn't mean May 1, any more than it means July 1, and that the time-table means exactly what it says. Here is how two far-sighted buyers are handling the situation. Both are using form letters—one

of them even has a form number, denoting a standard purchasing department form. The first is a letter for general circulation to all suppliers, calling attention to the policy in respect to schedules and advance deliveries. The second is sent in specific cases, to "first offenders". A third exhibit is a rubber stamp that is prominently placed on every order issued from another purchasing office.

If you haven't adopted a policy, or haven't found the effective means of controlling this condition, the time to start thinking about it and to do something about it, is now.

Gentlemen:

The material situation, generally speaking, during the last few months, unquestionably has become less critical, and as a result there has been a tendency on the part of many of our suppliers to disregard the delivery schedules specified on our orders and have taken it upon themselves to produce and ship our orders as soon as possible. Often times shipments are being made several months in advance of our specified deliveries.

We fully realize and appreciate the fact that many of these suppliers are doing their utmost to give us service and are shipping ahead of our specified deliveries feeling that they are actually doing us a favor. However, we as nearly everyone else, are operating under very crowded conditions with limited storage facilities and as a result any material accepted ahead of actual requirements must be handled several times, which creates an excessive handling expense. It must also be remembered that, today, we are all working on government contracts which may be cancelled at any time. We might add that we are not expecting any cancellations, but there is always that possibility. Should there be any such cancellations, any excessive inventory would naturally be our loss.

In view of the above we must insist that all suppliers adhere strictly to the deliveries specified on our orders. You will note from our purchase orders that the delivery dates shown are those on which material is to be in our plant. We realize that it is not always possible to ship so as to arrive on a definite date and, therefore, materials received a few days ahead of specified delivery dates will be accepted. Shipments received more than a few days in advance of the delivery specified on our orders will be returned at your expense without notification. Invoices covering such shipment will be returned for cancellation.

Very truly yours,
Assistant Purchasing Agent

Re: Purchase Order No. _____
Part Number (s) _____

Gentlemen:

Delivery of the above mentioned purchase order was made on Our delivery specifications call for delivery on or about but not before.

Under CMP Regulation No. 2, we are unable to carry an inventory of more than 60 days supply. Your shipment and our accepting delivery of this material before the date specified, will possibly increase our inventory beyond this allowable limit.

We are cooperating in this instance by accepting delivery, but we will not make payment of your invoice until either the 10th or 25th of the month after delivery should have been made, and we will take full discount privileges.

In the future, we hope you will abide by our delivery specifications because it will not be possible for us to accept any deliveries made before the date specified.

We wish to keep your good will and sincerely hope you will cooperate with us to the fullest extent.

Yours very truly,
Purchasing Department



GILBERT T. SCULLY
Purchasing Agent



VERNON HOMAN
Assistant Purchasing Agent

ACCURATE STOCK RECORDS for Purchasing and Production Control

**This purchasing department goes into action
as soon as the sales estimate is prepared,
eliminating the usual requisition procedure**

“WE have no elaborate set-ups in our purchasing, production and stockroom systems,” says Gilbert T. Scully, Purchasing Agent of The Delta Manufacturing Company, Milwaukee. “Rather, we insist on simple set-ups, which we believe to be quite efficient.”

They are efficient, indeed. And they are particularly worthy of the attention of other purchasing men because in this distinctly functional approach to the materials phase of management and operation, some of the time-honored concepts of procedure have apparently been violated, not only without detriment but with notably successful results. For instance, the purchasing process traditionally starts with a purchase requisition that states the need and

both authorizes and limits the purchase; but in this department there is no form corresponding to the conventional, itemized “purchase requisition”. Traditionally, too, that need and requisition originates in the production department, growing out of the manufacturing program; at Delta, the production department is not the first, but the last department to be concerned about material requirements. And the important fact is that these requirements have been taken care of before they become a matter for production concern.

Basically, this situation is due to good planning, and to the Stock Records Department, an adjunct of purchasing and stores, where five clerical workers break down and

screen the production orders according to their component materials and parts before they are passed along to purchasing and production, and keep an accurate record of how and where materials are applied after they are received.

Here's the way it works. The manufacturing schedule is projected for each quarter, in advance, on the basis of sales estimates that set forth the number of each of the fifteen to twenty types of power tools to be made in that period. These estimates originate in the sales department. In normal times, they represent quotas or sales expectancy. Under wartime conditions, this situation is complicated by the limitations on quantities authorized and materials available. Consequently,

the priorities department (which is a separate unit in this organization) collaborates by adjusting anticipated sales in accordance with current allotments, and incidentally sees to it that full advantage is taken of the total allotment so as to permit maximum production under the circumstances.

The resulting sales estimate, which thus becomes the manufacturing program, is stated in the simple memorandum form of internal company correspondence, and carbon copies are furnished to sales, stock records, purchasing and production departments. The stock records department immediately prepares a work sheet for the purchasing department, on each of the several products, or jobs, corresponding to the manufacturing releases, with a complete quantitative breakdown by the component parts required. Like the sales estimate, this is informal in physical make-up. As a matter of fact, the headings are hand-ruled in pencil on ruled sheets 15 inches wide, the length of the sheet being determined by the number of parts or items to be entered.

Basic data for these work sheets is drawn from the bill of materials on the product, from the manufacturing schedule, from experience records as to the quantity of service and replacement parts required per quarter, and from the perpetual record of stocks on hand (raw, in process, and finished parts) and on order. Thus it is far more than a simple bill of materials, for when the stock entries are made and the compilation of requirements completed, it provides the information for a complete purchasing program required to support the manufacturing program. It is in effect, on a

single sheet, a composite material requisition for each end-product in the quantities as released for manufacture—and it is the only type of requisition used, deriving its authority solely from the sales estimate, and without the use of a special requisition form. (Standard supply items such as bolts, nuts, washers, etc., and factory and operating supplies not going into the product itself, are handled through stated minimum stock quantities noted on the bin tags.)

Headings on the requisition or work sheets cover the following information: Part number; Description; Number used (per unit of product); Required on the previous schedule; Additional requirements on releases for the current quarter; Required for releases in the ensuing quarter; Three months' service and replacement requirements; Gross requirements; On hand—(a) finished and (b) rough; Net requirements; On order; To be ordered; Remarks. The last column is for the use of the purchasing department, to indicate that orders have been placed. This does not necessarily coincide exactly with the quantity "to be ordered", when, in the Purchasing Agent's judgment, quantities should be altered to conform with economical manufacturing practice, to earn a more favorable discount, to anticipate further requirements, or for any other good reason.

A complete list of parts to be purchased through regular purchase order procedure is drawn off from the work sheet and entered on a form known as the "Purchase Material Shortage" sheet, for use in follow-up. The next action on the work sheet is to insert the symbol

1. Above, the purchase order record file. Below, a supplementary information file kept in the Purchasing Agent's desk.
2. All items to be purchased are automatically listed as a "shortage" on the manufacturing order until they are actually in hand.
3. Working cards of the stock records department. Castings (rough and finished) are listed apart from the other store items and parts, and finished stock also has a separate file.
4. Transfers of material are carefully recorded to keep the records accurate. The work tag on a completed job becomes the authorization to deduct from work in process and transfer to finished stock.
5. Factory forms are tied into materials control by showing spoilage and scrap as well as the finished quantities.
6. When stock items fall below the stated minimum quantity, the bin card is sent to purchasing for replenishment of stock, and is temporarily replaced by a bright red card signalling this condition.

PAGE NO.
 QUANTITY
 NO.
 DATE
 REF. NO.
 ORDER NO.
 PART NO.
 NAME
 OPERATION NO.
 TIME NAME
 CLOCK NO.
 SHIP NO.

[illegible][illegible]

DAILY REPORT OF STOCK TRANSFERS

FROM **MINOR ASSEMBLY**

DATE _____ 19__

| No. | Description | Quan. | V. | Charge To | Received By |
|-----|-------------|-------|----|------------|-------------|
| | | | | Department | |
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INVENTORY REPORT

Prepared By _____

Number _____

Description _____

[illegible]

STOCK ROOM TRANSFERS

PRODUCTIVE - MATERIALS

DATE _____

DD. ORDER NO. _____

SEMBLY NO. _____

NO. _____

TO BE USED ON _____

| PART NO. | DESCRIPTION | FIRST DELIVERY | SECOND DELIVERY | PULLED BY |
|--------------------|-------------|----------------|-----------------|-----------|
| QUANTITY ORDERED | | | DATE | POSTED BY |
| QUANTITY DELIVERED | | | | |
| QUANTITY DUE | | | | CHECKED |
| STOCK BAL. ON HAND | | | | |

RECEIVED FROM - (SECTION 5101) 5000 GR. 100, STANDARD PAPER, S.P.

| Part No. | | | Section No. | | | Drawing No. | | |
|-----------|-------|------|--------------|-------|------|---------------|-------|------|
| Part Name | | | Section Name | | | Drawing Title | | |
| Date | Place | Name | Date | Place | Name | Date | Place | Name |
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Form PCWE-9-42-5M-P



Top: The purchasing department is a compact and efficient unit.
Above: Here in the stock record department production orders are screened according to component materials and parts.

"c" opposite the items of castings to be procured, and a symbol "*" for those parts to be manufactured by Delta itself. The symbols are introduced for the benefit of the production department, which issues shop orders accordingly. The rather ominous title of the "Purchase Material Shortage" form does not imply a condition of emergency. Obviously, whenever material is ordered for a specific manufacturing schedule, it is "short" until received.

The great advantage of having all such items listed on a single sheet is that it shows not only the itemized record, part by part, but

also the overall picture as it affects any given assembly, where the shortage of any one item would hold up production. The heading of this form shows the date for which the assembly is scheduled, and the date by which the material is required for this purpose. It is the responsibility of the purchasing department to see that these "shortages" are eliminated by procurement and delivery of the materials on scheduled time, so that the entire sheet can be cleared in accordance with the manufacturing program. As an extra precaution, two or three weeks before the time for assembly, the

stock records are rechecked and a physical count taken if necessary, to guard against the occasional instances of errors in clerical entries, or loss or diversion of the materials in question. This is done in time to permit whatever follow-up action may be necessary.

Purchase Records

The items to be purchased through regular purchase order procedure are first entered on a green card system, kept in the Purchasing Agent's desk drawer, where it is easily accessible for immediate reference. The file includes all items required in manufacture and assembly; each part is designated by either a numeral or alphabetical derivative of the part name. The description and specifications, weight, type of material involved, and the unit or units on which the particular part is to be used, are shown on the cards, along with entries of the purchase order number, date, vendor, quantity, price, discount, and tool and die costs. Quotations obtained and pertinent remarks are also recorded.

This card is maintained in addition to the more detailed purchase order record file, covering some 5,000 of these purchased items, which is kept on 5 x 8 buff index cards and is located in the purchasing office where it is available for immediate reference and use. This file includes both the SP or standard parts which are ordered for stock, and the DP or special parts ordered for a particular product and manufacturing release. The heading of this card identifies the part by description and part number, shows the time required for delivery, and provides for up to four vendors. The entries give the details of each purchase order as issued, and of receipts against these orders. A "second operation" record card, identical in every respect except for its identifying blue color, is inserted in the file for those items which must be sent outside the factory for some operation such as plating or heat treating. The heading shows what work is to be done, where the material is to be sent from, and where the processed material is to be delivered; the same provision for alternative vendors applies to such operations. These outside operations are handled through the purchasing department. Consequently the dual record, on buff and blue file cards, shows entire history of the purchase up to the point where the material is ready for use.

Standard stock parts follow an equally simple procedure. Every part is numbered, and is referred to by number in all the records and operations. These numbers are prominently stencilled on the stock room bins, so that items are easy to find, for accurate and orderly store-keeping is an essential part of this system. In addition to the stencilled number, each compartment also carries a bin card, 3 x 5 3/4, slipped into a metal holder. The bin card shows part number and name, and the minimum stock quantity. Entries show receipts, and the date when stock is issued, the quantity taken, and the balance remaining in stock. Whenever the latter figure falls below the stated minimum, the bin card is removed and sent to the purchasing department, where it serves as a requisition, again without the necessity of making out and handling an additional special requisition form. Meanwhile, a bright red bin card is substituted in the stock room—a visual danger signal showing at a glance just what items are below the minimum quantity and for which replenishments are being ordered.

Procedure for Ordering

The purchase order form and procedure follow standard practice. In addition to the original typed copy which is sent to the vendor, there are four carbon copies as follows: (1) yellow, for the purchasing department; (2) pink, for follow-up; (3) goldenrod, for the cost department; (4) green, with the price section blocked out, for the receiving department. The record of orders placed and of materials received is promptly entered on stock records.

It is a matter of policy in this company to send a blueprint with every purchase order, when available, and to give no more detailed information in the description of the item than is necessary to identify it with the print. This policy, adopted originally as the result of an unfortunate experience in transcribing dimensional data and retained because of its essential simplicity and positive control, puts a single authoritative specification into the hands of the vendor, and at the

same time that it saves clerical work in the writing of purchase orders, it eliminates one possibility of error and removes all doubt as to exactly what is wanted.

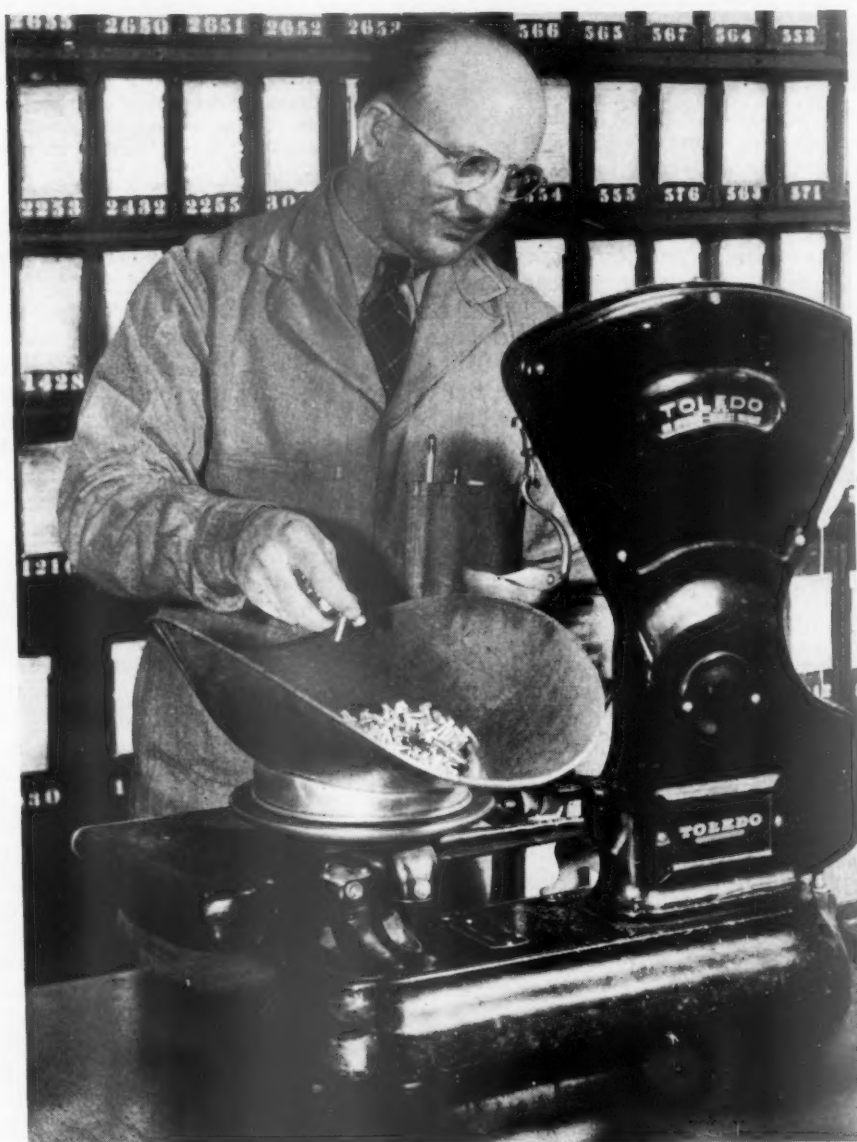
One other feature in connection with the issuing of purchase orders is of interest in emphasizing the legal requirements and implications of the Purchasing Agent's signature. It happens that The Delta Manufacturing Company is constituted as a partnership, and under Wisconsin law this must be shown in the signature, and the Purchasing Agent's signature shows not only his title but the additional words "Attorney In Fact" as the necessary legal evidence of his authority to make purchase commitments in the name of the company.

Scheduling Accessories

Accessories for the fifteen or twenty major units, whether manufactured for stock in the Delta plant

or procured by purchase for stock, are handled by means of a mimeographed form corresponding in general to the work sheet compiled from a manufacturing release, but based rather upon the anticipated quarterly requirements as shown in the stock records. Known as the "short form", it is a sheet 13 inches wide and 8 1/2 inches long. The column headings are: Part No.; Part name; Required; On hand, finished; On hand, rough; In process, shop; On order, vendor; To order—(a) shop, (b) vendor. This form is made out in triplicate, the white original copy for the production department, a blue copy for purchasing, and a yellow copy retained in the stock record department. This report becomes the "requisition" for a purchase or the authorization for manufacture, in order to bring the supply up to the anticipated requirement.

Continued on page 274



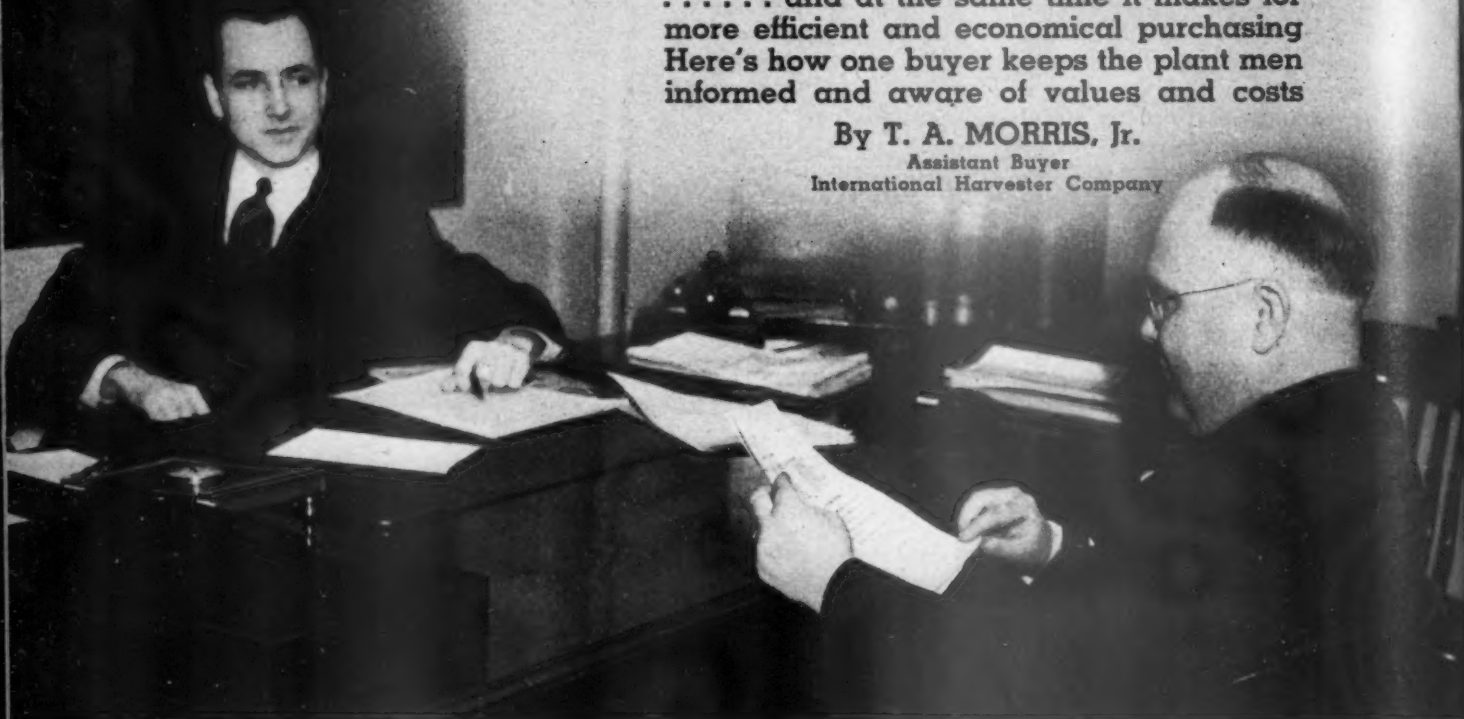
Part numbers are prominently stencilled on stockroom bins to aid in maintaining quick service and accurate inventories.

PURCHASE COST DATA

..... and at the same time it makes for more efficient and economical purchasing. Here's how one buyer keeps the plant men informed and aware of values and costs

By T. A. MORRIS, Jr.

Assistant Buyer
International Harvester Company



T. A. MORRIS, JR.

is a graduate of the School of Commerce, Washington and Lee University. He began his service in the purchasing department of International Harvester Company in 1935, and now specializes in the buying of small tools, mill supplies, and petroleum products.

COST analysis is the basis for efficient and economical purchasing. Every competent buyer makes cost comparisons as a matter of course, not only in terms of the initial price, but also in terms of the job to be done and the service that may reasonably be expected. In other words, he is seeking the greatest ultimate value per dollar of expenditure.

Observation of such cost studies affecting a wide variety of products, over a considerable period of time, indicates that there is no general rule for the correlation of price and value. In the examples cited below, there is one case in which the least expensive product is the most expensive one to use, while the one of highest first cost is the most economical, by a wide margin. But there is no consistent pattern in respect to the several intermediate grades. And in another closely related product, within the same classification, the superior ruggedness of the cheapest material offers the greatest economy and satisfaction. These facts are evident from the purchasing department's analysis of costs and from the record of use as reflected in the purchasing file.

But what of the plant men who

use and requisition these items? They, too, are interested in economical operation, and are cooperative in working toward that end. But they haven't the facts of relative cost on which to base a complete decision. Their experience and knowledge of applications and use are invaluable, but they show only one side of the picture that is needed as a guide in the search for value. Production men are keenly aware of the possibility noted in the first instance above where superior service (and in this case, greater value) may be expected from items of higher first cost. But if, in a well-meant effort to avoid the greater expenditure, they decided to compromise on one of the intermediate grades, the result would be unfortunate from the viewpoint of ultimate economy. And if they were to apply the same principle in the second instance cited, they would be headed in an utterly wrong direction.

The problem, therefore, is to bring together the plant man's experience and the purchasing man's knowledge of values, before the purchase is made. This might be accomplished by conference at the time that a requirement arises and a

request to purchase is received by the buyer. The request might be questioned; the two men could sit down together and iron out the differences between what the plant man thinks he wants and what the buyer thinks he should have, arriving by this process at a mutually satisfactory decision as to what constitutes the best purchase. That takes time, and it unfortunately dramatizes the differences in viewpoint rather than the common interest. Here at International Harvester Company we have found it a better plan to bring all these factors together, if possible, before the requisition is written and presented.

On many items of common use, where sources and costs are known, this can be accomplished very simply and satisfactorily by preparing a memorandum—from the purchasing department to production department where the item is to be used—stating the relative values in summary form, to supplement the factors of experience in making a selection for any particular purpose. Presented in this way, the information is distinctly a service contribution. It has been well received, as a practical and helpful service, by the plant men.

-helps the PRODUCTION MAN

More important, it is being used by them, and the best interests of efficient and economical operation and purchase are being served.

It is probably academic to raise the question of who makes the decision and selection under these circumstances, for no question of pre-

rogative is involved. Any conflict has been resolved before it arises. Both viewpoints have received due consideration—that of the man responsible for performance, and that of the man responsible for material costs. The result is a meeting of minds, a smooth flow of the

supply function from need to requisition to the writing of the purchase order, and an assurance of ultimate value in the purchase. And value is the particular concern of the purchasing department.

A typical memorandum is the following on small gage costs.

SMALL GAGE COSTS

Steel, Chrome, Stellite, Tungsten Carbide

This letter contains price and value comparisons on small gages. The data has been assembled to assist you in selecting the proper gages for your particular applications. Keep it in your file. It simply gives you, in convenient forms, prices on various gages in steel, chrome salvage, new chrome,

Stellite and tungsten carbide and is intended to supplement the other factors, including your own experience, which you consider in choosing a gage. The figures shown are net cost to us. The value relations were compiled from gage manufacturers' reports.

TABLE I.
CYLINDRICAL PLUG GAGES—Double End
AGD Std. Class Y

| SIZE | STEEL | CHROME SALVAGE | NEW CHROME | STELLITE CLASS X | CARBIDE |
|---------------|-------|----------------|------------|------------------|---------|
| .125"—.126" | 9.73 | 9.80 | 16.03 | 24.08 | 33.67 |
| .500 — .501 | 9.53 | 9.80 | 15.82 | 23.84 | 43.36 |
| 1.500 — 1.501 | 14.30 | 13.51 | 21.98 | 34.33 | 112.42 |

TABLE II.
THREAD PLUG GAGES—Double End

| SIZE | STEEL | NEW CHROME | CHROME SALVAGE | STELLITE | CARBIDE |
|--------------|-------|------------|----------------|----------|---------|
| 1/8" Special | 33.51 | 77.75 | — | 58.53 | — |
| 1/2—20 | 16.32 | 70.02 | 37. | 52.77 | 119.40 |
| 1 1/2—12 | 42.93 | 104.21 | 51. | 78.54 | 235.05 |

TABLE III.
ADJUSTABLE SNAP GAGES—AGD

| SIZE | STANDARD STEEL MODEL | SPHERICAL BUTTON & ANVIL CHROME PLATED MODEL | SSC | CARBIDE TIPPED |
|-------|----------------------|--|-----|----------------|
| 1/8 | 5.40 | 5.40 | | 32.83 |
| 1/2 | 5.75 | 5.75 | | 33.53 |
| 1 1/2 | 6.25 | 6.25 | | 34.53 |

Cylindrical Plug Gages

Relative value: (See Table I) If the life of a steel gage is 1 then chrome plate is 6; Stellite is 6 plus (equal to the best chrome plate without danger of chipping); and carbide is 40. Stated another way: If a steel plug will gage 500 pieces; chrome plate will measure 3,000; Stellite about 4,000 and carbide 20,000.

With your problem being to gage 25,000 pieces of 1/2" holes at one place, the use of steel would cost \$434. New steel plug with chrome salvage would cost \$88. (Figured as eight platings which is not always possible.) Stellite would cost \$147. and tungsten carbide \$43.

These value relations will, of course, vary with the application and depend on ordinary careful gage care. They are not, can not be made exact, but prices shown are accurate and the value expressed conservative.

Pilot Type Plugs

Pilot Type Plugs: If you want a Go plug gage that will practically fall into the hole specify "pilot feature". It consists of a chamfered edge and grooved ring which is patented and furnished on steel, chrome and carbide plugs by several sources. It can be added to existing gages. On some jobs chamfering the leading edge (for which there is no charge or which you may be doing in your own Tool Room) accomplishes the same purpose. It is not suitable for blind holes.

The advantages are: no jamming, less gaging time, fewer damaged plugs, fewer rejects on tight fits and increased gage life. The additional cost on a steel plug of 1/4" (smallest size) is only \$1.65; 1/2"—\$1.72; 1 1/2"—\$2.10.

Continued on page 288

STATEMENT OF COSTS AND PROPOSAL FOR NEGOTIATED SETTLEMENT
FOR SINGLE ITEM ORDERS. - TOTAL COST BASIS -

By _____ Order No. _____
Date of Termination _____
(This form is not obligatory, but information should be presented substantially in this manner).

DIRECT CHARGES

1. Direct Materials - Show materials in Schedule 1, attach copy of invoice and reconcile with required quantity by showing quantity required for one (1) piece.

2. Direct Labor - Show in schedule 2 method of arriving at number of hours and rate per hour.

3. Other Direct Charges - Detail in Schedule 3. Attach copies of invoices if purchased.

PRORATED CHARGES

4. Indirect factory expenses. Show in Schedule 4 method of arriving at rate and amount.

5. General and Administrative Expense. - Show in Schedule 5 method of arriving at rate and amount.

6. Other prorated expenses. If any, detail in Schedule 6.

7. Total Costs

8. Profit for work done prior to termination if any. Show calculations in Schedule 8. To be added if claimed.

9. Loss applicable to completed portion of contract. Show calculations in Schedule 8. Must be deducted.

10. TOTAL MANUFACTURER'S COST

11. Subcontractors' claims, if any. Detail in Schedule 11.

12. Expenses subsequent to termination. Detail in Schedule 12, if claimed

13. Grand Total Termination Charges

14. Deduct total units completed at Contract Price - Qty _____ ea. (If any invoices are unpaid, detail all shipments in Schedule 14.)

15. NET CANCELLATION CLAIM

We propose to settle our claim for the above amount by the offer in our quotation of _____ (Date).

NOTE: Do Not sign certificate, if it does not accurately express preparation of above statement.

SUPPORTING SCHEDULES (If more space is required, attach separate sheets)

Schedule 1. - Direct Material Costs: Reconciliation - Quantity required per unit.

Schedule 2. - Direct Labor

hrs. @ _____ hrs. @ _____ hr. = _____
hrs. @ _____ hr. = _____

The quantity of hours has been derived from (1) Actual Cost Records predicated on time tickets summarized. If above statement is not applicable and time is estimated, attach detailed estimate showing each operation, estimated time, and method of arriving at rate used.

Schedule 3. Nature of charge:

Schedule 4. - Rate applied is _____ % of direct labor cost. (If not arrived at in this way, explain). RECONCILIATION: During the period from _____ to _____, our total direct labor was _____ (Dollars) and our total factory expenses as shown by our books of account was _____, thus yielding the above rate.

CONTINUED

Page 2.
STATEMENT OF COSTS AND PROPOSAL FOR NEGOTIATED SETTLEMENT FOR SINGLE ITEM ORDERS.

Schedule 5. Detail in same manner as Schedule 4, showing basis of total and distribution, if not included in expenses in Schedule 4.

Schedule 6. Detail in same manner as Schedule 5, if any.

Schedule 8. We estimate the contract to be _____ % complete. (Attach schedule showing method of arriving at % of completion.)

THIS IS IMPORTANT.

Item 7. Total Cost

A. % of Completion _____ \$ _____ E. Indicated Loss if any _____ B - C

B. Indicated total cost if completed 100 X Item 7 _____ F. Portion of profit applicable to contract. A X D (If any, enter as Item 8, if claimed)

C. Selling Price if completed _____ G. Deductible portion of loss prior to termination C - B

*B. Indicated Profit if any, Qty completed _____ Total Qty on order X E _____ (If any, enter as item 9)

*Note: New uniform termination clause limits profit to 2% on raw materials, and 6% on total.

Schedule 11.

Co _____ Amt. _____

Schedule 12.

Schedule 14.

Contract: Qty. _____ Units @ \$ _____ ea. equals \$ _____ Total Contract Price

Completed Qty. _____ Units @ \$ _____ " " " " (Note "J")

Cancelled Qty. _____ Units @ \$ _____ " " " " Total

for which payment of our offer of settlement referred to in page 1 will be accepted in full satisfaction of our claim.

Note J: If not paid for, detail:

Deliveries accepted and paid _____ @ \$ _____ equals _____ Total

Deliveries unpaid (Note "K") _____ @ \$ _____ " " " " Total

Note "K": Attach listing of unpaid invoices.

PLEASE BE THOROUGH AND COMPLETE. IT WILL ENABLE YOU TO SECURE MORE PROMPT SETTLEMENT.

The undersigned certifies that, to the best of its knowledge and belief, the foregoing statement with respect to a subcontract or purchase order with _____ prepared for submission to said _____ and to Contracting Officers, acting in behalf of the United States of America, is true and correct, as itemized in the above summary and attached supporting schedules and explanations, has been prepared from the books of account and records of the undersigned in accordance with recognized accounting practices, includes (so far as costs are involved) only those costs necessary for the performance of said subcontract or purchase order, and the charges as stated are fair and reasonable. The undersigned makes this certificate with full knowledge that the foregoing statement will be used as a basis for settlement with the undersigned and that the amount of such settlement may be included in a claim for reimbursement under a contract with the United States.

Date _____ By _____ Co. _____
Title _____

HELPING SUBCONTRACTORS on TERMINATION COSTS

This simple mimeographed form enables suppliers to calculate claims promptly and provides the contractor with valid evidence for a negotiated settlement

By WILLIAM A. WALTER

ONE of the major problems in effecting negotiated settlements on terminated war contracts is the difficulty or delay in getting claims from subcontractors in such form that they will fulfill the requirements of the government contracting officers and substantiate the claim of the prime contractor. This is particularly true in dealing with the smaller concerns whose accounting records and knowledge of cost analysis is very sketchy or even non-existent. The emphasis on subcontracting in expediting production on war contracts, and the desire to put all available facilities to work, have put a far greater number of such concerns on vendor lists than would ordinarily be the case. It has been a constant responsibility of the contractor to help these suppliers with their problems of supply and production, in his own interest as well as theirs, and he now has a similar responsibility in helping them with the problems of contract termination.

In the course of a considerable experience on termination claims, few of the subcontractors have been found who have ever read Procurement Regulation 15 or the Termination Accounting Manual. For the most part, they are absolutely bewildered when they are confronted with the mass of schedules taken from the exhibits therein. Many of them will not even take the time to read any instructions that are sent to them. It is unusual for them even to read the letter of termination before they sign it.

To overcome this difficulty, the Cancellation Cost Analysis shown on the opposite page has been designed. The objective was to devise a form

that would be self-explanatory, and which a vendor could fill out from the simplest of records, without having to refer to any other instructions. It will be noted that the only reference to the government regulations is the limitation on profit allowances, and this is incorporated directly on the form at the appropriate point.

The calculation does, however, conform closely to the requirements of the contracting offices. The chief point of divergence is in the Profit and Loss formulae, which are different from, and considerably simpler than, those used in the Termination Accounting Manual, but arrive at the same result. One point should be particularly noted: the critical item in this formula is not the debatable one of "reasonable cost", but the percentage of completion of the order, on which an agreement can more readily be reached. Furthermore, if the contract is on the profit side, the claim will be the same with the same percentage of completion, regardless of the actual costs that may be involved.

Filling out this form requires the entry of only three major elements of cost—direct charges (material and labor); indirect or prorated charges (factory and administrative); and the claim for profit on work done prior to termination, or losses applicable to the completed portion of the contract. Deducting the amount received or due on the total number of units completed at contract price gives the amount of the net cancellation claim.

These entries are supported by eleven schedules, conveniently numbered to correspond with the items themselves. These schedules include a statement of the method of prorating indirect charges; an estimate of the percentage of completion and how it is made; the calculation of total cost, set forth in seven

successive steps, using the figures already entered and applying them in a simple formula; and summaries of subcontractors' claims, expenses subsequent to termination, and the completed shipments at contract price.

The form includes a certification as to the correctness of the data and a formal proposal for settlement of the claim.

While it is probable that there will always be a few of the smaller vendors from whom it will be difficult to get any kind of statement that will satisfactorily substantiate a claim in a negotiated settlement, this type of analysis should go a long way toward solving that difficulty. The figures used are basic in even the simplest systems of accounting, or can be reconstructed from ordinary business records so as to provide an honest, intelligent, and reasonably accurate estimate. The simplicity of the calculation commends it to the use of this available data. One of its great advantages is that it strongly tends to satisfy the vendor as to the fairness and adequacy of his claim.

Use of the form is of course optional, as indicated in the heading. This in itself places it in the category of a service rather than an arbitrary requirement, and establishes a relationship of cooperation rather than contention in calculating the claim. There will be many cases in which the contractor's own representative responsible for cancellation claims can assist in its preparation, helping himself at the same time that he is helping the subcontractor.

The principal benefit, however, is to the contractor, in that it speeds up the presentation of claims all along the line and provides the documentary evidence upon which a prompt and satisfactory settlement can be negotiated.

← The complete calculation of a termination claim can be compactly stated

ADJUSTING PURCHASE PLANS AND PERSONNEL to War and Post-War Conditions

Flexible organization and sound basic procedure have enabled this purchasing department to meet current problems with success and to look ahead with confidence

By HERBERT E. FLEMING

WHILE buying by industrial Purchasing Agents has been increased tremendously for war production, buying by purchasing departments of electric and gas utilities has been cut down. But in the interests of the war effort it has involved intensive work for them in adjustments to the regulations issued by the War Production Board's Office of War Utilities.

The Public Service Company of Northern Illinois supplies electric and gas service in a territory of approximately 6,000 square miles in the northeastern part of Illinois, outside the limits of the city of Chicago. It serves over 350,000 electric and 185,000 gas customers, in residential suburban, industrial suburban, urban, and rural communities. It has some forty merchandising stores or service centers and offices, embraced in three divisions, under the jurisdiction of

division vice-presidents with headquarters at Northbrook, Maywood and Joliet, respectively 25, 12, and 40 miles to the north, west, and southwest of downtown Chicago. Generating stations at Waukegan, 40 miles to the north, and at Joliet, together with interconnections in a large pool of electricity supply, furnish the power distributed through the company's lines. A large pipe line from the Texas area supplies under normal conditions the gas distributed through its mains.

The buying for this widely extended and diversified system is centralized in a Purchasing Department, situated, like the general offices of the Company, in the heart of downtown Chicago, readily accessible to most of its vendors. All told there are on the buying list of this department 12,000 items. Most of the requirements are for fabricated and semi-fabricated equipment,

those for raw materials, except for steel for the company's repair shops, being relatively small.

In the pre-war days the Public Service Purchasing Department's procurement was for three purposes: (1) system expansion, including extension of lines and mains, (2) electric and gas appliance merchandising and installation, (3) system operation and maintenance. Now, in the war days, its buying is chiefly for such maintenance and operation. Purchases for pushing the use of electric and gas appliances are out, since the appliance manufacturers are engaged about 100% in war production. And the purchases for system expansion are limited to extensions specifically authorized by the WPB, such as lines to war production plants, like the new Douglas aircraft plant, to war housing projects, and to dairies and farms producing food products for our armed forces.

During a peace-time year the number of purchase orders issued by Public Service, exclusive of the merchandise installation, customers'



Their jobs will be waiting for them after the war.



Experience and information is shared at regular meetings of the buyers and supervisory staff.

appliance repair, and small "local" orders issued by the division offices, runs to 50,000. Now the number of primary purchase orders issued by the Purchasing Department is down to about half that number. But to-day's orders appear to be mighty important for round-the-clock electric and gas service to homes, commercial establishments, and war industries in fourteen counties in Chicago's satellite region.

The most important adjustment that this company, and its Purchasing Department, like that of every utility, has been called on to make in the war effort has been adaptation of its operations to the inventory limitations established by the WPB's Office of War Utilities. These limitations, minute regulations with which every utility Purchasing Agent is familiar, are set forth in Utilities Order U-1, amended as of September, 1943. They are the outcome of orders worked up through cooperation between war production authorities and representatives of the utilities beginning back in the days of OPM.

Order U-1 primarily limits the purchase of materials to the minimum required for essential maintenance, operation, and repair. It establishes preference ratings and allotment symbols for that purpose. It also permits their use for purchase of materials for minor extensions or plant additions required to maintain service at a minimum standard. But the order limits these to \$1,500 for materials for underground work, and to \$500 for

overhead. And it expressly forbids split-ups of jobs to get under those figures. However, the WPB authorizes special permits for larger projects, such as extensions necessary for putting new war production plants in operation.

This U-1 order sets standards for what it defines as "excess inventory", namely anything over a company's "practical working minimum." It forbids a utility to receive deliveries of materials of a given class above that minimum, and it limits both the amount of materials that can be scheduled for delivery and the amount that can be withdrawn from inventory. These limits, for transmission, distribution, meter, house regulator, wire, cable, bus bar, and wood pole materials, are based upon the average use of materials during the last three quarters of 1942. For generating and pumping station and sub-station material, other than fuel, they are based on use in 1940, plus an adjustment for growth in load since that time.

Furthermore, the order provides that a utility must offer for sale all material in its "excess inventory" to another responsible utility or to other persons who can qualify for such purchase. Conversely the order provides that a utility may also buy out of the "excess" stock of another utility. While a utility is permitted to buy in the open market on a purchase order in amount less than \$100, it may not place orders in that market for a restricted list of important products without first obtaining from the

Right Below: An electrically operated order-writing machine is used for issuing up to 50,000 purchase orders annually.

Left Below: Prompt and courteous reception of callers is the rule in this purchasing organization.



Top: L. D. Reynolds, Purchasing Agent.

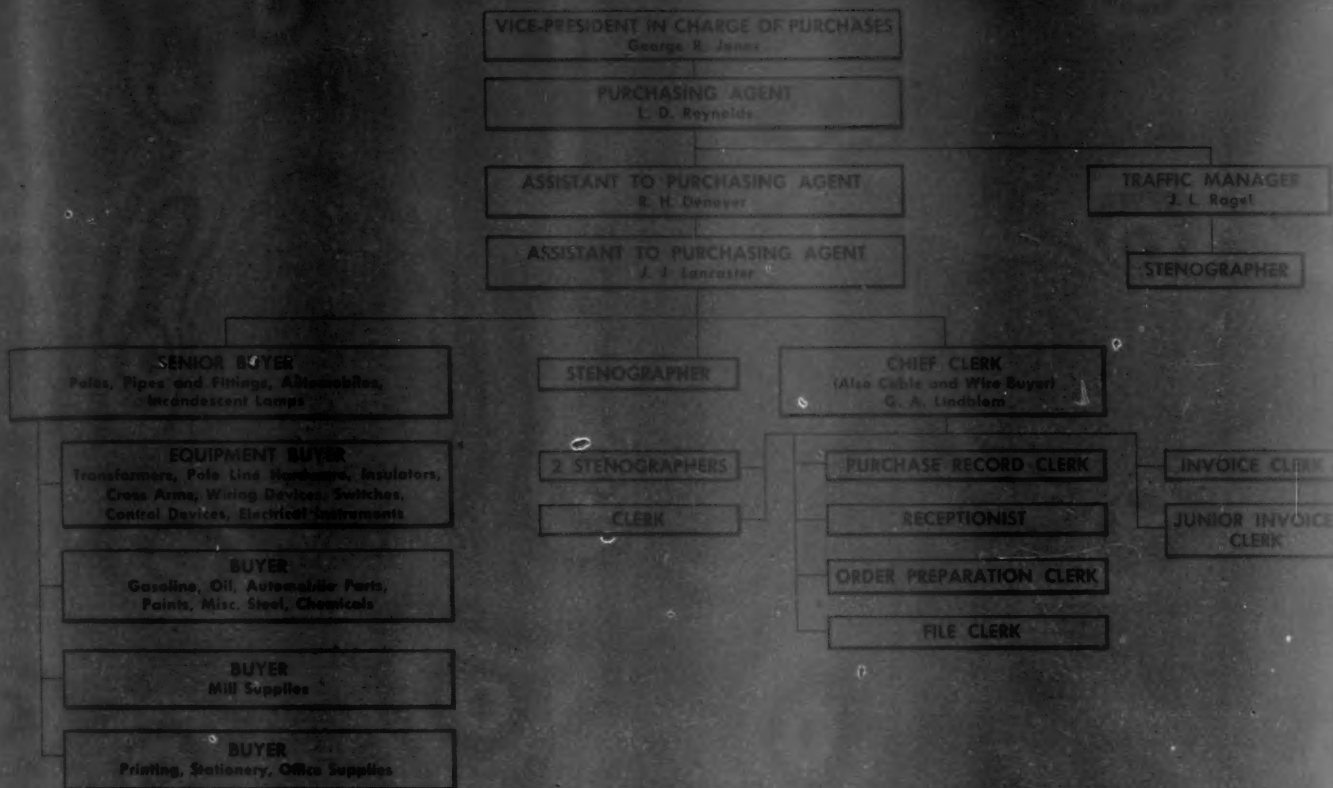
Top Center: R. H. Denoyer, Assistant to Purchasing Agent

Bottom Center: The buyers section of the purchasing department is a compact office unit.

Bottom: The clerical section, under the supervision of the Chief Clerk, adjoins the buyers section.



| | | | | | |
|---|--|---|--|---|--|
| PURCHASING DEPARTMENT COPY 1 PURCHASE ORDER | | PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS <small>GENERAL OFFICES, 72 WEST ADAMS STREET CHICAGO.</small> | | PACKAGES MUST BE MARKED WITH PURCHASE ORDER NUMBER 56320 | |
| VENDOR WILL NOT HONOR THIS COPY | | SHIP TO VIA F. O. B. DATE WANTED | | | |
| 2 PURCHASE ORDER | | PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS <small>GENERAL OFFICES, 72 WEST ADAMS STREET CHICAGO.</small> | | PACKAGES MUST BE MARKED WITH PURCHASE ORDER NUMBER 56320 | |
| RECEIVING DEPARTMENT'S COPY 3 PURCHASE ORDER | | SHIP TO VIA | | | |
| VENDOR WILL NOT HONOR THIS COPY | | SHIP TO VIA | | | |
| 4 PURCHASE ORDER | | PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS <small>GENERAL OFFICES, 72 WEST ADAMS STREET CHICAGO.</small> | | PACKAGES MUST BE MARKED WITH PURCHASE ORDER NUMBER 56320 | |
| RECEIVED FROM VENDOR WILL NOT HONOR THIS COPY | | RECEIVED AT VIA F. O. B. DATE WANTED | | | |
| QUANTITY RECEIVED FROM VENDOR WILL NOT HONOR THIS COPY | | RECEIVED AT VIA F. O. B. DATE WANTED | | | |
| GENERAL ACCOUNTING DEPARTMENT COPY 5 PURCHASE ORDER | | PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS <small>GENERAL OFFICES, 72 WEST ADAMS STREET CHICAGO.</small> | | PACKAGES MUST BE MARKED WITH PURCHASE ORDER NUMBER 56320 | |
| GENERAL OFFICE COPY 6 PURCHASE ORDER | | SHIP TO VIA | | | |
| PURCHASING DEPARTMENT COPY 8 PURCHASE ORDER | | SHIP TO VIA | | | |
| PURCHASING DEPARTMENT COPY 8 PURCHASE ORDER | | SHIP TO VIA | | | |
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Purchasing Department Organization.

by Nazi aggression. 4.—The thorough-going organization, development, and management of its Purchasing Department. 5.—The intimate acquaintance with advanced purchasing methods shown by L. D. Reynolds, Purchasing Agent, and R. H. Denoyer, Assistant to the Purchasing Agent. 6.—The flexibility that characterizes the work of the buyers and others in this department. 7.—The comprehensive development during the past two decades of the routines followed and the forms used in its procurement.

The inventory policy of this company in normal times has been chiefly to do buying only in sufficient quantities to balance inventory against current operating requirements. When the European phase of World War II loomed on the horizon, Public Service did extensive forward buying, well ahead of the time when the market tightened. Consequently when the emergency came the company was fortified with more than ample reserves of materials. That worked out well not only for this utility but also for other utilities which have drawn on its "excess inventory."

The organization of the supervisory, buying and clerical force of the Public Service Purchasing Department, its forms, and their flow in requisitions, purchases, and releases are shown in the accompanying illustrations. In this the Pur-

chasing Department has drawn not only on its own experiences but also on those of other companies. In connection with a reorganization of the department in 1924 and in subsequent years, Mr. Denoyer visited purchasing departments of many other utilities. It pays purchasing people to swap experiences.

All of the buyers in this Purchasing Department, including those having had university training, started with it as junior clerks, and soon all of them will receive pins showing that they have had fifteen years of service with the company.

Flexible Organization

Before the war there were in the department seven buyers. Now there are five. The merchandise buyer has been transferred to another department. The other, who specialized on incandescent lamps, is with the Army in North Africa, and his duties have been taken on by one of the five. His name and those of nine other men and three women are posted in the "Purchasing Department Service Roll" in the reception room of the department. With the force of the department reduced from 34 to 21, Mr. Reynolds has not replaced any buyer by a woman employee, and he has not replaced any of the men clerks now in the Armed services.

From time to time Mr. Reynolds

makes changes in the assignment of classes of items to the various buyers. Currently the principal classes are allocated among the five buyers and the Chief Clerk according to the following groupings: 1.—poles, pipe and fittings, automobiles, incandescent lamps; 2.—transformers, pole line hardware, insulators, cross arms, wiring devices, switches, control devices, electrical instruments, and other station equipment; 3.—gasoline, oil, automobile parts, paints, chemicals, miscellaneous steel; 4.—mill supplies; 5.—printing, stationery, office supplies; Chief Clerk—cable, wire, and miscellaneous.

The flexibility that prevails in the work of the buyers is a conspicuous feature of the functioning of the Public Service Purchasing Department. There is specialization, but in addition to the occasional reallocation of items, there is a requirement that each buyer keep reasonably well posted on lines other than those assigned to him. As a result when a given buyer is away from his desk, on account of illness, vacation, or a visit to a vendor's plant or a Division office, another buyer meets his callers or answers his 'phone. This is facilitated by the layout of the buyers' desks. There is likewise flexibility in much of the work of the Assistants to the Purchasing Agent, the Chief Clerk and the Senior Clerks.

A similar procedure is used on shipment releases, the purchasing department retaining the original, while the vendor gets the first carbon copy.

Flexibility and versatility in the work of the buyers is furthered by Mr. Reynolds' guidance policies. One of these is to have buyers go to the establishments of vendors and get personally acquainted with their representatives and their products; also to division offices of the company to learn intimately the problems of the men who send them requisitions in connection with constructions, sales, and installations.

Cooperation is Stressed in Staff Meetings

Another practice, followed regularly in pre-war days, is related to this one of visitation. This is to have meetings of the buyers at which each tells of what he has learned on his visits at vendors' plants and at company divisions. At first the exchanges of information were given informally, with the buyers seated. But later Mr. Reynolds found that it was desirable to have the buyers stand and get the practice of telling their stories more forcefully. These meetings are to be resumed after the war.

In all of the work of this department, Mr. Reynolds coaches its personnel to strive to create and maintain the good will of the company's customers and vendors, also to cooperate fully with other departments of the company. With pardonable pride he says that his standing orders to those ends are cheerfully complied with by all in the department.

While adjusting to wartime controls, and marking time on purchases for plant expansion and for appliance merchandising, Mr. Reynolds has found this a good time to re-appraise and re-define specifications, forms, and routines. One of the objectives of this is to have the pre-war system and practices in best possible shape for the prospective post-war boom in plant expansion and in electrical and gas appliance sales. This checking, in which Mr. Reynolds is assisted by Mr. Denoyer and others in the department, is made, as Mr. Reynolds said, "especially in the light of the many valuable contributions to be found in current books and trade magazines."

"As with other companies," says Mr. Reynolds, "our use of forms saves a lot of letter writing."

The flow of requisitions, purchase orders and releases is set forth in the diagram reproduced herewith. Mr. Reynolds had it first made when he took over the department in 1935. Besides this diagram the department has charts showing the flow of each of the following: Telephone Purchase Requisitions, Purchase Requisitions, Purchase Orders, Change Order Requests and Change Orders, Shipment of Returned Goods to Vendor, Adjustment Requests.

Purchases originate by requisitions to the Purchasing Department from many sources. The great volume of those for materials, supplies, and—in normal times—appliances,

are made by the three divisions. Each division has its own stock rooms. However, all requisitions clear through the office of the general store-keeper.

Signed Authorizations

One method followed for avoidance of misunderstandings over authorization of requisitions is especially interesting. This is to have on file in the Purchasing Department facsimiles of the signatures of those authorized to sign requisitions, according to a classification based on values. This practice makes for avoidance not only of misunderstanding; but also of delays in getting action on requisitions.

Many of the requisitions are initiated by telephone. But they are then recorded on a pink form entitled "Requisition by Telephone"—(PD 17). That, however, is followed up immediately by use of the regular Purchase Requisition (Form PD 6006). This is made out in triplicate, and the practice in the use of the Number 1 and Number 2 copies is such a good one for speeding up action that any Purchasing Agent who does not have it will find it worth consideration. The sub-title of the Number 1 copy says: "This copy to be routed for approvals." That on the Number 2 copy says: "Send this copy direct to Purchasing Department." Thus while the former is making the rounds for approvals, the latter is being used by the Purchasing Department in getting quotations, so as to be ready to place purchase orders promptly. At the bottom this copy, which lists items concerned by stores, item number and catalog number and description, has squares in which to show how the items have been priced: From a price list, a written quotation, or a cost record; and if through telephone quotation, by whom.

Realistic Scheduling

One of the efforts pressed by Mr. Reynolds has been to get requisition makers to fill out accurately the space reading "date wanted." This is especially important today for assuring compliance with the scheduling of delivery requirements under the U-1 order. The desired accuracy is attained through activities that assure the various departments that the materials purchased on their requisitions will be delivered on time. That in turn is accomplished through the activities of a Traffic Manager,

Specifications for standard materials, such as poles, pipe and wire, are supplied by the company's standard material specification book which is kept up to date by the Engineering Department. When special apparatus, such as a large transformer, or construction such as major building addition, is involved, specifications are prepared by company engineers or by outside consulting engineers or architects, and the contracts for such work checked by the company's legal de-

Right: Printed forms such as this tracer for invoices obviate a great deal of routine correspondence.

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partment. Before letting the written contracts, Purchasing Agent Reynolds secures bids, and after these have been checked by the engineering and other departments concerned, including the insurance department, he completes final arrangements for the purchases.

There are four different purchase order forms used by the Public Service: PD 6001 — Purchase Order, eight copies; PD 6056 — Merchandise Installation Order, three copies; PD 6013 — Customer's Appliance Repair Order, two copies; PD 6005 — Local Order, four copies.

The Purchase Order (PD 6001) is used in three ways: (1) as an order for a single purchase; (2) as a master or blanket order; for example, an order to a manufacturer of appliances purchased for resale, such as washing machines, water heaters, gas and electric ranges, ironing machines, vacuum cleaners, and toasters; (3) as a master order for services through a given period. Before this master-order practice was adopted, the Purchasing Department was burdened with small orders, repeated almost daily, and on the larger appliances for one, two or three units. Under the master-order routine, the divisions secured in the pre-war days, and in the post-war they expect to secure, shipments from the various vendors on releases against the master orders. For this there is a form entitled "Shipment Release", (PD 6023) issued by the Stores Department. However, all purchase transactions of divisions and other departments are subject to check and control by the Purchasing Department.

Second Copy to Vendor

A unique feature of the Purchase Order (Form PD 6001) is that the Number 2 copy, typed from carbon, not the Number 1 copy, goes to the vendor. That makes a better record than does the carbon copy, and it is necessary for a utility to keep on file the records of its purchases for an exceptionally long time. Instructions, in white letters on a black background, appear on the face of the vendor's copy, and conditions to be complied with appear in printed form on the reverse side. The Number 1 copy is retained by the Purchasing Department in its numerical file and the Number 18 copy in its purchase and cost records and alphabetical file. The other copies go, according to their headings, as follows: "3 — Receiving

Department Copy; 4 — Receiving Ticket; 5 — General Accounting Department Copy; 6 — General Office Copy; 7 — Tracer."

The "Tracer" copy and the tracing practice of this Purchasing Department are advanced developments. "Tracing both for materials and for invoices is basic in purchasing," said Mr. Reynolds. "Our buyers have taken over the tracing of material shipments. With the use of the tracer copy of our purchase order and their telephoning we expedite the delivery of materials, so that the shipments get to the places where needed as early as possible according to the dates named on the requisitions."

Miscellaneous Forms

Invoice tracing is done by a tracing clerk in the department. For this the "Tracer" (Form PD 6009) is sent to the vendor. Public Service requires suppliers to send invoices in duplicate. When a vendor inadvertently sends only one copy of his invoice, this Purchasing Department, instead of asking him for a duplicate, makes out a copy on its Form PD 2, signing a certification that it is a true copy.

In the interchange of purchasing methods among utilities, the Public Service forms for "Merchandise Installation Order" (PD 6056) and "Customer's Appliance Repair Order" (PD 6013) have been found useful and have been widely adopted by other utilities. This is probably due to their help in meeting problems arising in the practices of the utilities in selling appliances, in promoting their sale by neighborhood dealers, and in their installation. The Merchandise Installation order is issued in the divisions. It goes to local contractors for installing appliances such as ranges and water heaters. There are a Contractor's Copy, an Inspection Copy, and a Control Copy. The Contractor's Copy obligates him for workmen's compensation claims, for payroll taxes and for all features of social security benefits.

The Customer's Appliance Repair Order is issued by the divisions when it is necessary to have an appliance returned to factory, because it does not lend itself to local repairs. It is also used when Public Service orders a part to replace one in a customer-owned appliance.

The Local Order (Form PD 6005) is a small form used in the divisions and stations for urgent small purchases. It carries a line

which says: "Notice: This Order Not Good for More Than \$5.00." On another it says: "Employees: Always Put Cost of Goods Purchased Plainly on This Order." This form evidently has been worked out with care. It is made out in quadruplicate, carrying directions as follows for the numbered copies: "1— This copy for the Merchant; 2— Send this copy with prices marked hereon to Storekeeper; 3—Storekeeper retains this copy in book until bill is received, then attaches same to invoice; 4—Storekeeper retains this copy."

The purchase order forms, other than that for the local order, are about half standard letter size. The use of this smaller size not only saves on paper cost, but also saves an estimated one-fifth on storage drawers.

The purchase orders used during the war are extensively marked up with rubber stamps, for entries to show certifications of compliance with WPB and other Federal and State regulations. This has raised a question as to the advisability of increasing the size of the purchase order form; but the answer has been that after a while the war will be won and over.

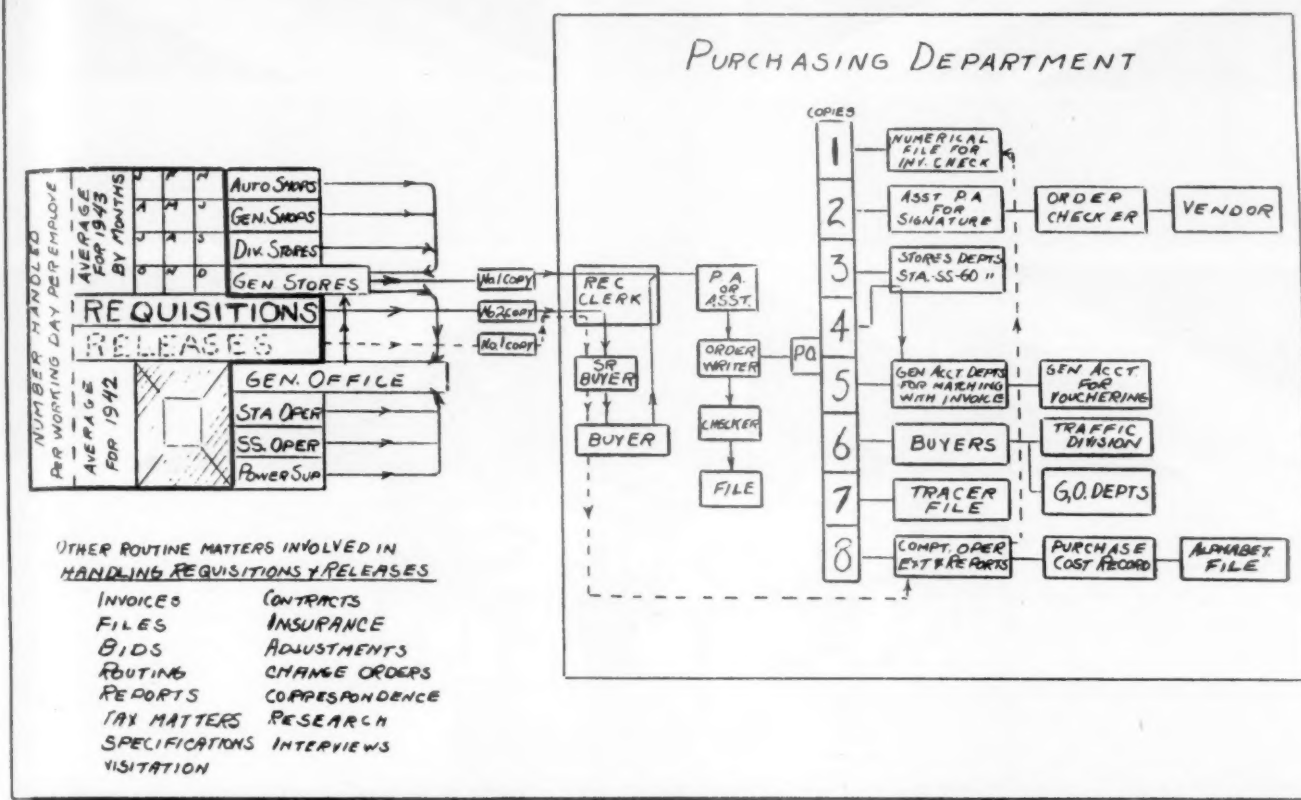
This purchasing department uses a number of well worked out forms in addition to those so far described. One is an Adjustment Request (PD 6012) from the makers of requisitions for adjustments.

Handling Adjustments

Adjustments concerning defective or returned material are handled by the buyers in negotiations with the vendors. This practice is followed for four reasons: (1) These buyers are in telephone contact with the vendors, (2) they have a broader view of the problems and greater familiarity with the details involved than a clerk could have, (3) they are in position to tell a vendor when complaints accumulate concerning features of his product or packaging, and (4) this puts the buyer in better position for dealing with the vendor in future purchases. Basis for such action is an Adjustment Request (PD 6012) from the makers of requisitions.

A very helpful form is the Purchase and Cost Record (PD 6014), a double 4x6 inch card filed by articles, and having columns headed: "Vendor, Date, Purchase Order Number, Purchase Requisition Number, Vendor's Catalog Number, Quantity Ordered, Priced Per...."

FLOW OF REQUISITIONS, PURCHASE ORDERS AND RELEASES



The flow chart is a duplicated form, used also as a report of departmental activities.

Trade Discount, f.o.b." This serves as a check on the buyers for any errors in pricing orders.

Each buyer files his own price data, but not correspondence. The buyers keep some of the commonly used catalogs at their desks, but most of them are filed, grouped by sizes, and arranged alphabetically in glass-front bookcases in the department offices.

Requisitions, quotations, contracts, purchase orders, bills of lading, express receipts, and other Purchasing Department documents, are kept in the files for different periods of years. The length of time of holding some is determined by the regulations of the Illinois Commerce Commission. The Company's standard record schedule for this department lists length of time other records are kept. The Number 1 copy of each Purchase Order, for example, is retained in the department for two years and in company record room five additional years, but the Number 8 alphabetical file copy is retained only one year, and the Number 7, or tracing copy, only pending receipt of invoice.

The Traffic Section, as shown in the accompanying organization

chart, is a unit of the Public Service Purchasing Department. Its functions are the responsibility for routing railroad, motor truck and express traffic (except company transportation and local division cartage), expediting deliveries, eliminating demurrage charges, checking on invoices, and prosecuting claims. Requisitions on carload shipments pass through the Traffic Manager's hands for notation as to correct routing and traffic classification for lowest transportation charge. He gives similar information to the Fuel Agent for Public Service and some of the companies with which it is affiliated. He supplies the buyers in the Purchasing Department with a routing guide on LCL shipments. All this results not only in a saving in the transportation cost but also helps insure delivery on time.

This expediting by the Traffic Section was developed in pre-war years, is being carried on, and will be a factor in the post-war period. J. L. Ragel, the Traffic Manager, has carried on the work of this section for the past twenty years.

Mr. Reynolds, the Purchasing Agent, and all of the key men in

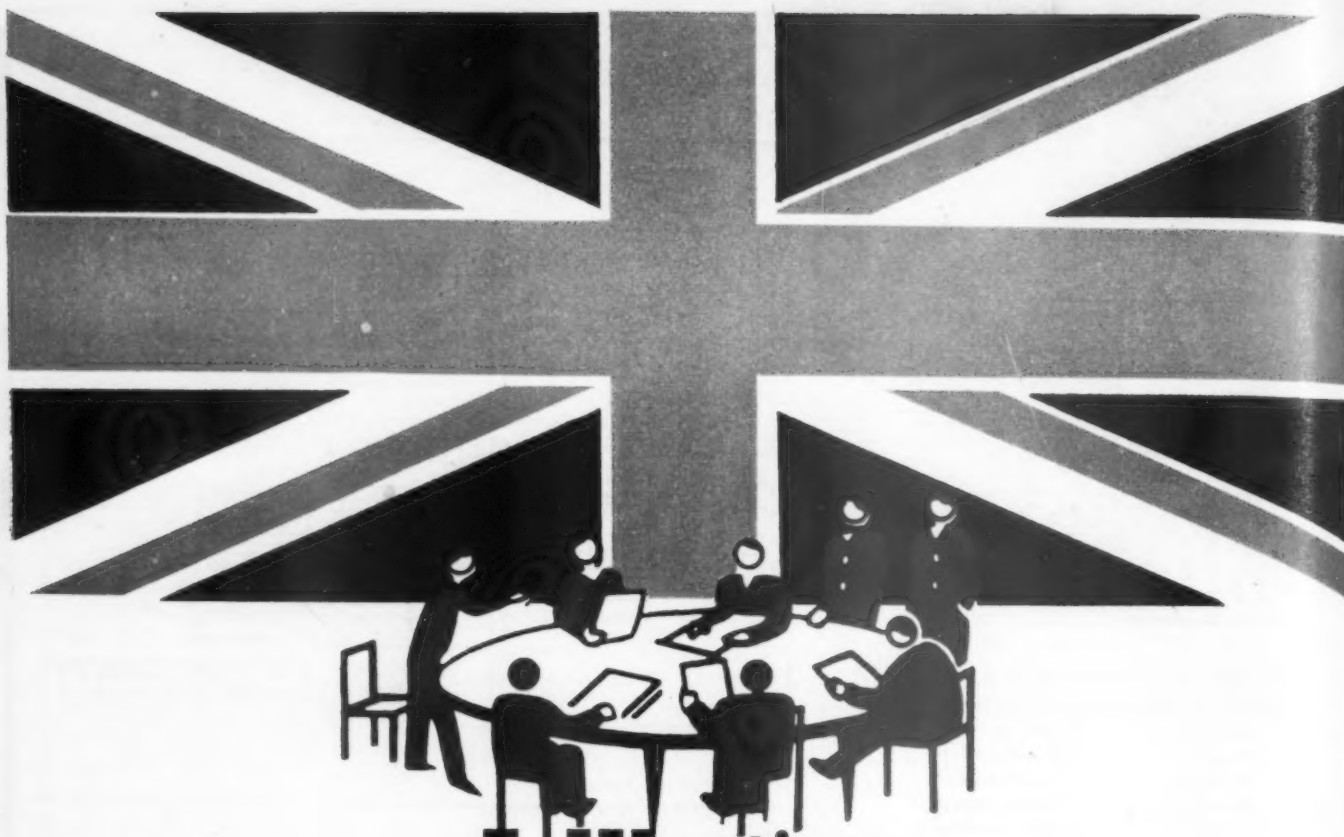
the Purchasing Department are veterans in this organization.

After two years at Carnegie "Tech" at Pittsburgh and two with the American Car and Foundry Company, Mr. Reynolds entered the employ of the predecessor to the Public Service Company in 1909, in its drafting room. His primary work was on maps for right of way for transmission lines. He became right of way agent and, in the latter 1920's, real estate manager.

His first purchase for the company was a group of parcels of land for a right of way. Every Purchasing Agent and every buyer knows that patience is one of the outstanding traits he must develop. Mr. Reynolds, in dealing with hundreds of people on this work learned in the hard way the value of developing patience.

Mr. Reynolds is one of those purchasing agents who has the look ahead and who keeps up to date by reading and having available in his office current issues of leading business magazines. He also has a pocket scrap-book, from which he occasionally quotes to his associates.

Continued on page 268



A Wartime "PURCHASING CONVENTION" in England

The program covered everything from A to Zed

By COLONEL WAYNE R. ALLEN

General Purchasing Agent, European Theater of Operations, U. S. Army

A NUMBER of us attached to the General Purchasing Board in Great Britain, met with the Purchasing Officers' Association of Great Britain. We didn't meet socially—we met partly as a "clinic", partly as a conference.

Space being a deterrent here to any general meeting, and early blackout limiting attendance, a large gathering was out of the question. Twelve of the officers of the General Purchasing Board here met with twenty representative Purchasing Officers of British industry. For three-and-a-half hours, there was nothing but serious discussion of mutual problems—mainly their problems and ours as we saw them now, and, of course, questions pertaining to business on a pre-war basis. Our men were asking questions as to the methods used by these people here, and vice versa.

The President of the Purchasing Officers Association of Great Britain is Mr. J. H. Bright, Chief Purchasing Officer of George Salter & Co. Ltd. manufacturers of weighing machines, pressure gauges, springs and roller bearings. With his jewel of office, he was present, and assisted splendidly with the meeting. But the meeting was actually run by last year's President, who is Chairman of their Association. The jewel of office is an important part of the British system of things. From the Judges of the Courts, the Lord Mayor of London, the Mayors of the various Boroughs, cities and towns, to the Chief Officers of Associations there goes the jewel of the office. A nice custom.

The British Association is a National organization, with seven locals, all located in Great Britain

and with a total membership of approximately 550. There is none in Northern Ireland. They do not meet in convention, as we do, but they are talking about doing it after the War. As a matter of fact, until I met with their London "local" some months ago, there hadn't been a meeting of their associations here for over three years. The blitz of the large manufacturing districts and of London itself rather disrupted such things as meetings.

I admired the seriousness of those Purchasing Officers meeting with us. These men and women (yes, there are women P. O.s) recognize the importance of their task, and much of the success of the war effort over here has been due to the efficiency of the members of the purchasing profession. Britain, such a small area relatively when compared with most of our States, with

its 45,000,000 of people, lives only because of the efficiency of its industry and transport, and from what I can see of their purchasing agents, they have contributed greatly to the success of their companies—which is the reason why Great Britain has been so successful in production.

P.O.'s they call themselves, not P.A.'s. A man is either "Purchasing Officer" or "Chief Officer of Supplies". Also, some are designated as "Chief Buyer".

There is an interesting point in the scheme of procurement over here in that most British purchasing officers today are really "travelers", which is the common designation for our "salesmen". Goods are not bought under bids. To insure the proper flow of goods to factories, "buyers" are sent out to other works where goods move from, to "expedite" the shipments. I suppose we would call such people "expeditors". Here they call them "travelers" as if they were salesmen. In fact, there is a point and a good one, that every Purchasing Officer must in fact be a "Traveler", for obtaining goods at all is a task these days which takes the persuasive power of the most "demon" of all salesmen!

A Big Job Accomplished

And these people here have been doing that most demon of all jobs in obtaining the goods here in the United Kingdom needed to maintain the production for the war effort. The biggest of all jobs which they have undertaken, which industry has been able to accomplish through the able assistance of these Purchasing Officers of course, has been the absorption into the channels of their industrial machine, the additional requirements for our United States Forces overseas. The magnitude of their additional effort as measured in dollars of goods supplied to us was covered in the so-called White Paper of the Chancellor of the Exchequer of the Government of the United Kingdom, which stated that \$328,000,000 of supplies and services had been furnished. Added to that figure is a total of \$536,000,000 which represents construction supplies and shipping services, or a total in money value for the period June 1, 1942, to June 20, 1943 of \$864,000,000. This figure is an estimated figure only, and my quotation is for the purpose of indicating an approximate value of goods obtained, only.

The White Paper properly states that there is no basis of measuring the quantities of goods furnished,

for most goods, generally speaking, cost less over here in Britain than the price in the United States—due to the difference in wage rates and other conditions.

In quantity, measured in the manner which we of the Purchasing Office measure procurement of goods in the United Kingdom, in measurement ships' tons, there was obtained during the period June 1, 1942, to Sept. 30, 1943, 2,391,052 ships' tons of supplies, not including construction materials.

The Chief Engineer of our forces here in Britain estimates that during the same period of the report as outlined above, over 3,000,000 ships' tons of construction supplies and equipment was obtained here. So the Purchasing Officers of Great Britain have been doing their part in "scrounging" out the additional materials necessary to manufacture or process for our requirements the rather huge volume of goods as stated before. "Scrounge" is to me

a strictly British expression. I never heard it before, but find that most of my British cousins in the purchasing business use it frequently here. To "scrounge" means to find—by fair means or foul—some item in short supply and denotes generally that some "traveling" must have been done to get the goods.

A great part of our meeting was devoted to pursuing this question of the "traveler". The question was presented by one of our own officers as to how salesmen were interviewed and disposed of. In peacetime the methods employed by the British, as presented to us, were all at variance, just exactly as most of the methods employed in the United States vary with the personality of the Chief or of his management. But these people were mostly interested in wartime procedure. We all obtained a good look into their current methods of operating their offices here as a result of the friendly

(Continued on page 270)





Dr. E. V. WILLS

CLASSIFYING COMMODITIES

for Purchase, Storage and Issue

The Federal Standard Stock Catalog has proved its worth as a practical working tool in many ways, facilitating inter-agency transfer of supplies, transfer of stores personnel, analysis and tabulation of purchases by dollar values, and the preparation of bills of materials

By DR. ELBERT VAUGHN WILLS

Chief, Standards Division
Procurement Division, U. S. Treasury

CLASSIFICATION, as the bringing together of those things which have similar characteristics or the segregation of things which are like and unlike according to the criteria of differentiation adopted, is one of the most widespread forms of procedure in the fields of the various sciences and in commercial and industrial activity. In biology, for example, the development of uniform classification and nomenclature is a problem of such importance that it has been differentiated as the science of taxonomy. The classification of the constitution and structure of rock formations in the various ages engages the attention of the geologist. In general there is a direct correlation between adequacy of classification and scientific development and progress. So far is this the case that science, as contrasted with empirical opinion, may be defined as classified and tested knowledge.

No less important, if less uniform as to basic criteria within a particular field, is the application of classification in productive industry, in cost determination and general accounting, in marketing, in purchasing, in storekeeping, and in sales or issue.

In purchasing and storekeeping, an adequate system of classification is a fundamental prerequisite of effective material control. Inasmuch as the needs to which classifications are required to minister are widely diversified, management engineers would generally doubtless agree that variations in methods of classification will be required in various types of application, and that no

single pattern of classification can be regarded as equally adapted to all requirements.

Federal Standard Stock Catalog

We are here specifically concerned with the classification for storage and issue and the grouping for procurement developed in connection with the compilation of the Federal Standard Stock Catalog. The purpose of the Catalog is to list in orderly and classified arrangement all supplies regularly procured, stored and issued by or for the various departments and establishments of the Government, and to furnish in the case of each item of such supplies the information necessary for procurement, storage and issue.

Many divergent types of need for classification will be found among Government activities. Consequently various other systems of classification, serving other functions, will be found in use, such, for example, as the decimal system employed in the listing of specifications in the "National Directory of Commodity Specifications," first published by the National Bureau of Standards in 1925, and issued in revised form in 1932 as National Bureau of Standards Miscellaneous Publication No. 130; the "Purpose Classifications Under the Defense Aid Program," prepared by the Office for Emergency Management; and the "Standard Commodity Classification," a classified list of Crude Materials, Basic Materials and Products, and End Products developed by the Inter-agency Committee on Commodity Classification.

The Federal Standard Stock Catalog, as already implied, seeks to establish standardization and to maintain interdepartmental uniformity in the classification, nomenclature, identifying numbers, specification data and other pertinent descriptive matter in the case of all supplies regularly used. Its compilation was begun in 1929 under the supervision of the Chief Coordinator, Federal Coordinating Service, who was, in turn, responsible to the Director of the Bureau of the Budget. Between that date and 1931, the Catalog was prepared, printed in loose-leaf form, and made available to the various departments and establishments of the Federal Government. Provision was also made for sale to the public through the office of the Superintendent of Documents, Government Printing Office. A detailed listing of the portions of the Catalog thus available for sale appears in Price List 75, issued by the Superintendent of Documents. The maintenance of the Federal Standard Stock Catalog was transferred to the Procurement Division, Treasury Department, upon the establishment of that Division in 1933. At the same time the Federal Coordinating Service was abolished.

Six Catalog Sections

The Federal Standard Stock Catalog comprises the following sections:

I. *General Index Of Federal Property.* This section lists in alphabetical arrangement each item of supplies regularly procured, stored, and issued by or for the various

TABLE I:

Commodity Classifications for Storage and Issue

1. Guns (anti-aircraft; boat; coast-defense; drill; field; machine; main-battery; secondary-battery; siege); gun-mounts; instruments (fire-control; optical); and their parts.
2. Arms, Small; and all accessories, outfits and parts.
3. Mines; Nets; Torpedoes; torpedo-tubes; and all accessories, outfits and parts.
4. Ammunition: ammunition-details; blasting-apparatus; bombs.
5. Flags; Bunting.
6. Anchors; anchor-chains; and other ground-tackle (boat and ship).
7. Fuel: charcoal; coal; coke; dust-fuels; gas; gasoline; oil (fuel); wood; etc.
8. Motor-vehicle accessories, outfits and carts; bicycles.
9. Boats.
10. Boilers and Engines (boat; power); and all accessories, outfits and parts.
11. Pumps; and their parts.
12. Boat and Ship-Fittings.
13. Engine-Room and Fire-Room-Fittings, Supplies and Tools.
14. Oils (illuminating and lubricating); greases; and all lubricants.
15. Electric-Cable and Wire (insulated).
16. Radio and Sound-Signal-Apparatus; and all accessories, outfits and parts.
17. Electric-Apparatus; and all accessories, outfits and parts.
18. Instruments of Precision; and all accessories, outfits and parts.
19. Blocks; Rigging; and all accessories, outfits and parts.
20. Submarine-Material.
21. Cordage; hemp; jute; oakum; twine; including manufactured articles.
22. Rope, Wire; and Wire, Bare; including manufactured articles.
23. Boat and Ship-Utensils.
24. Duck; canvas; tentage; including manufactured articles and accessories.
25. Tobacco-Products: cigars; cigarettes; and all accessories, outfits and supplies.
26. Furniture.
27. Dry-Goods; Textiles: bedding; buttons; curtains; cushions; draperies; findings; floor-coverings; linoleum; notions; oilcloth; trimmings; upholstered-materials; yarns, etc.
28. Blank-Forms.
29. Toilet-Articles; and all accessories, outfits and parts.
30. Bathroom and Toilet-Fixtures; and all accessories, outfits and parts.
31. Lighting-Apparatus (non-electric); and all accessories, outfits and parts.
32. Fire-Surfacing and Heat-Insulating-Material.
33. Gaskets; Hose; Packing; Rubber (Sheet and Strip); hose-fittings; tubing (flexible); including manufactured articles.
34. Leather: belting; harness; saddlery; including manufactured leather articles.
35. Books: blueprints; charts; drawings; libraries; maps; newspapers; periodicals; professional-publications, etc.
36. Musical-Instruments; music; and all accessories, outfits, and parts.
37. Athletic-Equipment; Recreational-Apparatus; Sporting-Goods; special wearing-apparel.
38. Brooms; Brushes.
39. Lumber; Timber: (barrels; boxes; cases; crates) wooden; railroad-ties; including manufactured lumber.
40. Tools, Machine (bending-rolls drop-hammers; drills; grinders; lathes; milling-machines; planers; presses; punches; riveters; rolling-machines; saws; shears; etc.); and all accessories, outfits, and parts.
41. Tools, Hand.
42. Hardware (builders'; general).
43. Bolts; Nuts; Rivets; Screws; Washers.
44. Pipe; Tubes; Tubing (non-flexible).
45. Pipe-Fittings.
46. Metal in Bars (flat; hexagon; octagon; round; square); billets; ingots; pigs; slabs.
47. Metal in Plates and Sheets.
48. Metal-Shapes (angles; channels; half-rounds; I-beams; tees; zees; etc.); structural-metal.
49. Camouflaging-Equipment: nets; netting; impregnated-strips; etc.
50. Foundry-Apparatus; and all accessories, outfits, and supplies.
51. Acids; Chemicals; Drugs; Gases; Soaps; abrasive-materials; cleaning, cutting and polishing-compounds.
52. Paints; Paint-Ingredients.
53. Stationery: bags, paper, books, blank; boxes, paper; cartons; drafting-room, office and printers'-supplies.
54. Office-Equipment: adding-machines; cash-registers; numbering-machines; typewriters; etc.
55. Textile-Clothing; knitted-goods.
56. Food: groceries; ice; provisions; subsistence.
57. Hospital, Laboratory and Surgical-Apparatus; and all accessories, outfits, parts and supplies.
58. Railway, Dock and Yard-Equipment; including Fire-Fighting-Apparatus.
59. Building-Material: asphalt; brick; cement; granite; gravel; lime; mill-work; roofing-material; sand; stone; tar; tiling, etc.
60. Boilers and Engines (Power-Plant; Ship); and all accessories, outfits, and parts.
61. Gyro-Compasses; and all accessories, outfits and parts.
62. Articles of Special Value: bullion; jewelry; museum-collections; paintings; precious-metals and stones; statuary; works of art; etc.
63. Tableware (barracks; crews'-mess; hotel; hospital; officers'-mess; ship-saloon); aluminum-ware; chinaware; glassware; silverware.
64. Bake-Shop and Kitchen-Apparatus and Utensils: aluminum-utensils; galley-gear; tinware; and all accessories, outfits, and parts.
65. Ovens, ranges and stoves; and all accessories, outfits, and parts.
66. Machinery; and equipment.
67. Forage: bulbs and roots; plants, shrubs and trees; seeds.
68. Live-stock.
69. Vehicles (animal and hand-drawn); and all accessories, outfits, and parts.
70. Agricultural-Implements; and all accessories, outfits, and parts.
71. Badges; Insignia; Medals; etc.
72. Boots; Shoes: leather and rubber-clothing.
73. Caps; Hats; Gloves; men's and women's-furnishings.
74. Individual-Equipment (field and landing-force).
75. Engines (boat, Diesel); and all accessories, outfits and parts.
76. Installation Fittings for Engines (boat, Diesel).
77. Reserved.
78. Motorized-Equipment.
79. Bridge-Components: military.
80. Airplanes; Complete (Without-Engines).
81. Major-Structural-Spares-and-Assemblies; Airplane.
82. Minor-Structural-Spares-and-Parts; Airplane.
83. Accessories-and-Equipment-and-Parts-Thereof; Airplane; and Special-Airplane-Tools.
84. Engines; Airplane (with-or-without-accessories).
85. Parts, Engine; Airplane (and-special-airplane-engine-tools).
86. Accessories-and-Parts; Engine, Airplane.
87. Propellers; Airplane (including-hubs, control-units, accessory-control-equipment-and-parts).
88. Instruments, Aeronautical (and-parts-thereof).
89. Arresting-Launching-Handling-And-Servicing Gear, Aeronautical (and parts-thereof).
90. Airships, Lighter-Than-Air (and parts-strictly-peculiar-thereto).
91. Airships, Lighter-Than-Air, Major structural spares and assemblies.
92. Airships, Lighter-Than-Air, Minor structural spares and parts.
93. Aviation-Training-Devices (and parts thereof).

Government departments and establishments, and indicates the class for storage and issue, the group for procurement, and the applicable Federal specification, if any.

II. *Classes For Storage And Issue.* This section comprises 92 active classes, the criterion of classification being similarity of utilization or storage requirements. There is listed in alphabetical arrangement under each class each item of supplies regularly stored and issued by or for the various departments and establishments, specifications, standard nomenclature, stock numbers, data as to departments by which used to facilitate interdepartmental transfer of supplies, approximate prices, and code words to facilitate the placing of orders by radio or telegraph. This section embodies also Storage Notes and Storage Precautions. The classification is shown in Table I.

III. *Groups For Procurement.* Each group on the procurement classification represents a major division of productive industry. These groups are in turn subdivided into divisions conforming to the general trend of specialization in the industry concerned. There have been prepared and published about 250

procurement information monographs embodying detailed information required by Government procurement agencies as to geographical distribution of sources of supply, variation in practice as to production or marketing, and other data requisite for economical and expeditious procurement. The groups, without their subdivisions, are listed in Table II.

IV. *Federal Specifications,* the technical requirements of which are mandatory upon all executive departments and establishments.

V. *Addenda* to the Federal Standard Stock Catalog, comprising additions, corrections and deletions.

VI. *Supplements,* prepared for individual departments and establishments. These list only the commodities carried by the department or establishment for which prepared. The tendency in the revision of the Catalog during the past few years has been largely in the direction of preparing individual department or establishment supplements, on account of the greater convenience in utilizing these supplements in offices and warehouses. Uniformity in classification, nomenclature and stock numbers is, of course, maintained between the

various supplements, thus permitting ready identification of supplies for interdepartmental transfer.

Uniform Nomenclature is Essential

The Federal Standard Stock Catalog grew out of practical needs arising in the course of experience in the procurement, storage, issue and inventorying of supplies and the accounting operations incidental thereto. Some of the specific problems with which it sought to deal may be summarized briefly.

First among these problems was that of unsystematic arrangement of commodities in warehouses. As a result of this condition serious delays and difficulties were encountered in locating supplies. The transfer of storehouse personnel from one warehouse to another or even from one floor of a warehouse to another, to cope with variations in the flow of work was rendered difficult.

Generally an item of supplies will be called by any one of several synonymous names, which may happen to come first into the mind of the individual having occasion to refer to it. Because of this diversity in the nomenclature employed in the requisitioning and han-

TABLE II:
Commodity Groups for Purposes of Procurement

| | |
|--|---|
| A. Aircraft, boats, and ships. | GG. Instruments. |
| B. Animals. | HH. Insulating-materials. |
| C. Animal-products. | JJ. Knit-goods, netting and webbing. |
| D. Arms (small). | KK. Leather and leather-goods. |
| E. Artillery. | LL. Live-stock, poultry and marine-products. |
| F. Boilers, engines, and tanks. | MM. Lumber and timber. |
| G. Books and printed matter. | NN. Lumber-products. |
| H. Brooms and brushes. | OO. Machinery. |
| J. Cable and wire (insulated). | PP. Meats and sea-foods. |
| K. Canvas articles. | QQ. Metals. |
| L. Cellulose and products. | RR. Metal-products. |
| M. Ceramics. | SS. Minerals and products (non-metallic). |
| N. Cereals and products. | TT. Paints, pigments, varnishes, and products. |
| O. Chemicals. | UU. Paper and Products. |
| P. Cleaning and polishing materials. | VV. Petroleum and products. |
| Q. Coal and products. | WW. Pipe, pipe-fitting, plumbing-fixtures, tubes and tubing (metallic). |
| R. Coal-tar and products. | XX. Pumps. |
| S. Cooking and heating-apparatus, furnaces and ovens (non-electric). | YY. Recreational-articles. |
| T. Cordage, twine, and products. | ZZ. Rubber and rubber-goods. |
| U. Drugs and medicines. | AAA. Scales. |
| V. Dry goods and notions. | BBB. Suits and uniforms. |
| W. Electric-apparatus. | CCC. Textiles (yardage). |
| X. Explosives. | DDD. Textile-products. |
| Y. Fruits. | EEE. Tobacco and products. |
| Z. Fruit-products. | FFF. Toilet-articles. |
| AA. Furniture. | GGG. Tools. |
| BB. Gases. | HHH. Vegetables. |
| CC. Generators and motors. | III. Vegetable-products. |
| DD. Glass and glassware. | KKK. Vehicles. |
| EE. Groceries. | LLL. Wood-products. |
| FF. Hardware. | |

Variations in nomenclature also operate to render impracticable the maintenance of an accurate record of receipts and issues of stock. It will be readily apparent that if an item is requisitioned and invoiced, for example, as a key and is carried in warehouse stock as a wrench, clerks recording receipts and issues of stock from copies of invoices will, in the absence of a distinguishing number or symbol, be exceedingly unlikely to identify the transaction with the record of stock pertaining to the item issued. Under such circumstances close conformity between inventory and stock records in any case will be a coincidence rather than a condition to be expected.

Accurate Stock Records and Orderly Procurement

The disparity between stock records and the actual condition of stock balances also affects seriously the procurement of supplies. Where efforts are made to replenish stock on a systematic basis, and to distribute such replenishment as evenly as practicable throughout the year, periodical replenishments will be largely dependent for their success upon the accuracy with which the records of stock on hand reflect the actual condition of such stock balances.

Where there are marked discrepancies, it will often happen that an item omitted from the periodical replenishment because an adequate supply was indicated by stock records as being on hand, will soon thereafter be reported exhausted and it will be found that the record of the condition of stock was at variance with the actual balance, owing to failure to identify issues with the proper item. Such instances necessitate an emergency replenishment

Top: Sample page of Catalog Section I, General Index of Government Property.

Top Center: Sample page of Catalog Section II, detailed listing of commodities by classes for storage and issue.

Lower Center: Sample page of a Procurement Information Monograph, Catalog Section III.

Bottom: Sample of a Federal Specification, Catalog Section IV. This specification for ball bearings is a 36-page booklet. 5 x 8, punched for ring binder. It is complete with diagrams, tables of dimensions, tolerances and ratings, and application data.

SECTION I
GENERAL INDEX OF FEDERAL PROPERTY
ABACI-ADZES

| Name of Article | | Class for Disposition and Payment | Federal Disposition | Name of Article | Class for Disposition and Payment | Federal Disposition |
|-----------------|---------|-----------------------------------|---------------------|---|-----------------------------------|---------------------|
| ADAPTER | 18 GGS | 18 | | ADAPTERS (AERONAUTICAL-MATERIAL): parachute-harness. | 49 | 49 |
| | 18 GGG | 18 | | ADAPTERS (AERONAUTICAL-MATERIAL): reduction-right angle, tailcone. | 15 | SWD |
| | 21 222v | 00 | | ADAPTERS (AIR-REGISTER-ATOMIZER)..... | 00 | FI |
| | | | | ADAPTERS (AIR-REGISTER-ATOMIZER)..... | 17 | FI |

BRASS

FEDERAL STANDARD STOCK CATALOGUE

(SEC. II—PART 6)

Class 47—3
(May, 1981)

| DEPART- MENTS | | ESTABLISH- MENTS | | | | | | STOCK NO. | DESCRIPTION | SPECIFICATIONS, Plain Box, Net wt., Etc. | Unit or Lot Size | Cost per Unit | Code Word |
|------------------|---|---------------------|---|---|---|---|---|-----------|--|---|---------------------|------------------|-----------|
| C | I | L | N | O | Q | V | Z | | | | | | |
| | | | | | | | | | ALUMINUM-ALLOY (Aluminum-Manganese): <i>SHEET X-HARD, GRAY-FINISH--</i> | N: 47-A-4. Use: Motor-Bowl construction and repairs. | | | Tehoris |
| X | | | | | | | | 47-A-855 | Thickness, .070 | Width, 24 inches | Length, 72 inches | | |
| X | | | | | | | | 47-A-860 | .070 | 24 | 96 | | |
| X | | | | | | | | | | | | (10) 30 | |

FEDERAL STANDARD STOCK CATALOGUE

SECTION III

(PART 7)

GROUP MM—Division r

(Issued May, 1931)

HARDWOODS

Pro. Cat.: A.

Fed. Spec.: MM-L-701

I. PLAN FOR FEDERAL PROCUREMENT.

I. PLAN FOR FEDERAL PROCUREMENT.
There are no special laws or statutes governing the procurement of this commodity. Each Government department and independent establishment makes purchases in quantities sufficient only to meet its own requirements by inviting bids from distributors located throughout the country. No special provisions other than the regular specifications are incorporated in contracts covering such purchases.

II. SOURCES OF SUPPLY.

A. NUMBER, LOCATION, AND SIZES OF COMMERCIAL SOURCES OF SUPPLY.

1. FORESTS.

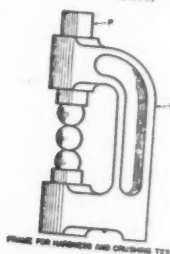
(U. S. Department of Agriculture; American Forests and Forest Products.)

TABLE I.—Estimated present stand of hardwood saw timber by regions (millions of feet, board measure)

[illegible]

97-2-171-10
(Aug. 1942)

FEDERAL STANDARD STOCK CATALOG
(Section IV, Part 5)



FRAME FOR HARDNESS AND CRUSHING TEST



FIGURE 1.

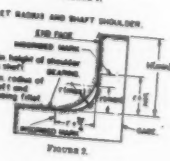


FIGURE 2.

FEDERAL STANDARD STOCK CATALOG
(Section IV, part 5) FF-B-171-1
(Aug. 1941)

APPENDIX

NOTES ON BALL-BEARING APPLICATION AND INSTALLATION

[illegible]

transaction and in most cases result in higher cost of the commodity as compared with the price at which it could have been included in the regular purchase.

The Federal Standard Stock Catalog undertakes to establish a standardized system of nomenclature upon the basis of which the name of each article may be determined and the use of synonyms avoided. The first word of the nomenclature of each item is the noun which names it in the broadest manner. This is followed by modifiers in the order of their increasing intensiveness in qualifying the meaning of the generic term, the most intensive part of the nomenclature being placed last and consisting ordinarily of the size, where size is an essential part of the description. Obviously cross division must be avoided. The method outlined will be recognized as an application of the principle illustrated in formal logic by the Tree of Porphyry.

The detailed listing of commodities in the Federal Standard Stock Catalog appears under the various Classes for Storage and Issue in Section II. This through standardized nomenclature, stock numbers, and alphabetical arrangement, furnishes the detailed pattern for the location of the stock in warehouses and the maintenance of stock records. The standard stock number will be recognized as a form of symbolization. The number is made up of three portions: (a) the class number, (b) the initial letter of the name of the item, and (c) the serial number. These serial numbers are so chosen that the items in each class, under each initial letter, are arranged in numerical order, so that an item of stock may be readily located either by its nomenclature or by its stock number.

Classifying Spare Parts

As we have indicated already, the classification for storage and issue, forming the basis of Section II of the Federal Standard Stock Catalog was founded primarily upon similarity of utilization or storage requirements. These criteria, however, were not set up upon the basis of theoretical considerations alone. The closest contact was maintained throughout with the actual work of storage and issue activities. Hence there were necessitated numerous accommodations to special requirements some of which it may be well to explain, inasmuch as they are likely to be interpreted at first glance as inconsistencies.

One of the most intricate and

exact of the problems encountered in devising and applying a practicable storage and issue classification arises in connection with the handling of spare parts which are procured with or for machinery or other equipment on which they are to be used to replace similar parts when the latter are no longer serviceable.

Parts listed as spares by manufacturers, and which purchasing officers are required to procure, fall into two categories. The first of these is made up of parts which are peculiar to the equipment for which furnished. They may be interchangeable among the units of a single type or model produced by the same manufacturer, or they may be so specialized that they must be procured under nameplate data for a single piece of equipment. Such spares should, of course, be classified with the equipment to which they are peculiar.

Standard Commercial Parts

The second category is made up of parts which, while listed by manufacturers of machinery or other equipment under manufacturers' numbers, are nevertheless commercial items which are susceptible to many other applications and in many cases are carried in stock for general issue. An excellent illustration of this type of spare is furnished by ball bearings. Manufacturers' parts lists, for machinery and similar equipment, generally list ball and roller bearings under part numbers of the manufacturer of the equipment with which they are to be used. Frequently, however, it is found upon investigation that such bearings are merely purchased from bearing manufacturers and installed without modification and that they are replaceable by any standard bearing of the same type, bore, outside diameter, width, and type of filling.

For instance, one activity reported for inclusion in the Federal Standard Stock Catalog lists of spare parts for a power-driven lawn mower, two tractors and a platform elevating truck. All of these parts lists included ball bearings. Investigation was undertaken to determine the types of bearings procured, the commercial numbers of these bearings and whether they were modified in any respect prior to installation. It was found that one type and size of bearing was common to all four of these pieces of equipment. In addition, the same

bearing was requested by the same activity for general issue. It was cataloged, accordingly, as an item of general issue with explanatory notes indicating its various applications.

This resulted in the maintenance of one stock of the bearings in question, rather than five stocks, i. e., one for general issue and one as a special spare part for each of the pieces of equipment with which it was used under a manufacturer's part number. On the other hand, where it appears, upon investigation, that a bearing or other similar item purchased from a manufacturer is modified prior to installation in such a way as to necessitate similar modification in a piece used for replacement, it is of course classified and cataloged as a special spare part.

Some Special Problems

The method of cataloging spare parts which has been described, together with the inclusiveness of many generic names, sometimes leads to misunderstanding on the part of those unacquainted with the Catalog as to the proper scope of the several classes. For instance, Class 43 covers bolts, nuts, rivets, screws and washers. The bolts here included are the metallic pins, screw-threaded at one or both ends to receive a nut or for use as a stud, and employed for holding objects together.

There are, however, many other articles known as bolts to which this classification does not apply. On the one hand, there are bolts which are primarily sliding catches, that is, movable bars protruded or retracted by hand to fasten or release a door, gate, window-sash, etc. These items are properly builders' hardware and, accordingly, fall under Class 42. On the other hand, certain parts of ordnance equipment are designated as bolts and are properly classified as spares with the equipment on which they are used. Special bolts are classified as spares in other classes. The General Index of Federal Property, Section I of the Catalog, furnishes a classification guide in such instances.

Another source of misunderstanding concerning the use of the storage and issues classification arises from the increasing extent to which the stock numbers of the Catalog are being used as identifying symbols, establishing both differentiation and essential descriptive data, for making tabulations of money values of equipment or sup-

(Continued on page 276)



The way to prevent a surplus is to get rid of it—*Now*

By CHARLES FORD

A VERY wise old bird of my acquaintance, when confronted by the question, to sell or not to sell some bunch of junk that had outlived its usefulness and was cluttering up the landscape, had one reply:

"Sell and repent!"

What he meant is obvious. If there is any money left in the stuff, get that money out and start it working to produce some more. Maybe you will have the feeling afterward that you might have done better; meanwhile the money realized has begun to earn, which the stuff never did. Do your repenting after the sale if you feel that way, but don't let it cramp your style in getting rid of questionable assets.

Every bunch of junk, every lot of stuff that has stopped moving and doesn't seem to have any future, is a liability. It earns you nothing. You have to store it, heat it, light it, insure it, supervise it; you probably have to pay wages to jackass it around from place to place to make room for its betters. If it was worth a ten-dollar bill when you started thinking about it, a year's

harboring would reduce its value to maybe seven bucks; two years about four of the same. It owes you money at a rapidly increasing rate. Your only chance may be to burn the place down and collect the insurance.

But the minute you sell, you cut off all expense and further depreciation, and get a little dough to invest in something that will pay.

Government Style

I won't vouch for the verbal accuracy of the following; I saw it in one of the business papers and am quoting from memory. But I guess my version is near enough for practical purposes. Some government department or another had a machine, a new automatic of sorts, for which there wasn't any use, so they offered it for sale—an unusually enlightened proceeding for a government department. The original price was about \$4700; after devious and deadly figuring, the brass hats in charge decided that anybody who wanted that machine should pay about \$6500 for it, after signing some fourteen various documents in quintuplicate, pledging the buyer to

do everything under the sun to avoid making a little money out of it. The machine was all right; if they had no use for it why shouldn't some gullible geezer take the rap and furnish unshakable alibis for a bunch of tape-bound officials?

Now fancy a blowed-in-the-glass Purchasing Agent faced with a proposition of this sort. If it was the only suitable machine on earth and his house must have it or bust, he might, after a proper show of wrangling, pay the price, sign away all rights to life, liberty and the pursuit of happiness, to say nothing of the Four Freedoms, wait two to six months while officialdom deliberated, and perhaps finally get hold of the machine.

But if, anywhere within the borders of the United States and Canada, there was another suitable machine and the Purchasing Agent got wind of it, that government machine could accumulate spider-webs until doomsday and see if he cared.

Everybody's Problem

We are now at the peak of war production. We may roost on that

peak for a while, but reasonably soon we aren't going to need so much shooting material, and the war production movement will be gradually downhill. The most tropical imagination will congeal at the thought of how much stuff will be left idle or have to be reconverted to civilian purposes. The quantities of metals, textiles, paper, machines, that will have to be disposed of or become a total loss would, if cashed in at cost, make a neat little dent in the national debt.

Private hands or public hands—it makes no difference, except that the stuff in private hands stands a better chance of being converted into spendable money than that owned by the government. The smart guy who finds himself saddled with a lot of industrial cats and dogs is going to get into the market with them and raise himself some cash; and it's going to be just too bad for the last ones in line.

Uncle Sam is going to have one sweet bunch of frozen assets to thaw out, and how will he go about it? The government officials who will control the disposal of the aforesaid cats and dogs won't have to pay the losses; they are just as likely to set up rules and regulations for disposal that will keep a mass of material hanging over the market indefinitely. They don't lose either way; but we lose both ways. Nevertheless the thing to do is to get the stuff into circulation as speedily as possible.

Sell and repent!

Thinking Ahead

We have had a couple of horrible examples of market withholding in the governmental hock-shop that has been tying up wheat and cotton in the guise of loans to the forgotten farmer. If this man's war hadn't happened, the situation would have been a lot more serious; the war has given us a chance to redeem some of the pawn-tickets. Whereas, if we had added to our already unwieldy store the unsalable portions of a few more crops, something would have busted.

No market can be healthy with a huge flood of commodities hanging over it, held back only by the flimsy dam of political pawn-brokerage. One would think that the innocent farmer with the doors of Uncle Sam's pawn-shop held invitingly open, would scratch his head and get busy to raise the damndest bumperest crops in history; but I hazard the opinion that this sort of thing is really a damper on energy and resourcefulness. The three gilt balls with the government shield behind them are just a reason for

being lazy. Even with a flood of weakly dammed — and heavily damned — merchandise hanging over us we don't stir out from under. The Arkansaw farmer, when it rained, couldn't mend his leaky roof; when the weather was fair, he didn't need to.

We hear a lot of talk about the tremendous demand just waiting until the bombs stop dropping, but there seems to be damned little clear thinking about it. Of one thing we may be sure, nothing is going to be normal for some time to come. Perhaps the soberest expectation we may entertain is that, when the last Jap is laid out to frizzle on the Hadean gridiron we may be able to figure out about where we stand. And not before. That restful time is a lot farther ahead than most people think. I will risk my prophetic reputation with the prediction that anybody who reckons we will be able to stop fighting in Europe this year is kidding himself; by the time we have neatly tucked away Mr. Hitler and his troop of thugs we shall have gone through some experiences. More of them than we will let ourselves believe.

But, there may be some justifiable let-down in war production when we have only one enemy left to clean up. Some civilian manufactures sorely needed may be given the green light to slow down the production lapse, but as always during war, materials for destruction will continue to have the right of way. Civilian needs will be very gingerly recognized, because, until the very last plane has left the assembly line, industrial activity will hinge on that last plane. There will

be an immense labor supply to be dealt with; and it won't take much unemployment to deplete savings to the point where people will think several times before they order the new car. A little depression may be inevitable, and it may prove a dangerous thing. The government won't need to worry much about siphoning off earnings; nature will take its course in that little matter. What taxes may leave us will be needed for corned beef and cabbage, and we will be back to first principles.

Elementary Economics

Still, and yet, and however, it won't do to ignore or minimize a huge bulk of converted and semi-converted materials, either in government or private hands. Until liquidated, this mass of materials will be a market menace; and the longer it is held back by government red tape, or by first reader economic wisdom, the greater the menace.

If the stuff is forced out, it will mean low prices; but if it is held back, it will be a depressing blanket over the market and a definite threat to progress. Low prices are far from an unmixed evil. They will expedite turning idle materials into marketable goods at lower prices, which will help a good many people. And if we try to hang on to stuff until it accumulates rust and mildew and cobwebs, disposal will take that much longer and everybody will be partially smothered under the blanket.

So I again quote my wise old bird:

Sell and repent!

1 1 1

100 OCTANE AVIATION "GAS" NOT GASOLINE

Far Superior to Beat Standard Fuels

Wartime 100-octane aviation gasoline is not what was called 100-octane gasoline before Pearl Harbor, nor is it gasoline in the true sense, according to the Petroleum Administration for War, though still called gasoline for convenience. It is super-fuel produced by rearranging the petroleum hydrocarbon molecules through the use of catalysts. This 100-octane fuel starts with a synthetic base stock that is about equal in potential power, and far superior in other qualities to automobile gasoline that has been "doctored" to its limit. Aviation fuel requires hard-to-get synthetic petroleum derivatives that conventional refining cannot produce, and production of them reduces the

amount of raw material available for making gasoline for motorists. Aviation fuel must be absolutely freed of numerous unwanted natural impurities which are inconsequential in a motor car, but which mean life or death in aircraft engines.

Although automobile gasoline can be raised to a top of about 87-octane on the regular gasoline scale, it is not even the equivalent of 87-octane aviation fuel, the grade used by light civilian and training aircraft. The superiority of 100-octane gasoline over 91-octane gasoline today is approximately the same as the superiority of 100-octane gasoline over 87-octane gasoline in 1940.



SPENDING AND SAVING



THE PEOPLES MONEY

IV. PLANNING THE STATUTE

By MARY E. O'CONNOR

IN most of the state constitutions there is no provision for the modern version of centralized standardization and purchase. This is a serious omission. Only through constitutional protection can this major function of government be assured of continuity. Without such a fundamental safeguard, one statute can be superseded by a contradictory measure. "Jokers" or "riders" added to appropriation or other bills may sometimes have the effect of removing a project from the jurisdiction of the purchasing officer, even when this is not the intention of the Legislature.

Before centralized standardization and purchase can be inaugurated, a statute must be drafted sanctioning and defining its jurisdiction and granting the necessary powers to the purchasing officer. As Governor Nathan L. Miller of New York said in his recommendations to the Legislature in 1922: "The statute should be flexible enough to permit the department of purchase and

supply to be organized on broad lines, and gradually to take over the work without disarrangement of it."

There should be preliminary research to ascertain the policy to be established, as well as the extent of purchase jurisdiction desired. The plan should include all reasonable powers and make provision for likely contingencies. The measure itself must be drafted by lawyers and legislators, but its basic content should be suggested by those who are familiar with this phase of government administration. The law should be explicit; vague or verbose statutes are a positive temptation to irregularities. No law can be self-administrative, but the more concise and definite it is made, the less is the likelihood of inefficiency in its administration. Clear cut lines should be drawn in the statute between the functions of purchasing, appropriating, paying, and auditing; each should be distinct and restricted in its own field, to avoid

duplication of effort and conflicts of authority.

Powers and Duties of the Purchasing Officer

The purchasing officer should have the authority, upon request, to represent any group of state agencies in arranging a contract or agreement of any kind which he can negotiate to better advantage than they can, acting individually—always provided that such contract or agreement is made in accordance with law, that there is money appropriated or available for the purpose, and that the arrangement is in the public interests. Furthermore, because of his relationship to the various state agencies and of his jurisdictional duties, the purchasing officer should act as advisor to the Governor, to the Legislature, and to other budget-making authorities. His knowledge of markets and the records of his department should be always at their disposal.

The powers vested in the pur-

chasing officer by statute should enable him to have access to the quarters, records and information of other state units in instances pertinent to the duties of his office.



Moreover, he should be authorized to require or subpoena the attendance before him of witnesses as well as to compel the production or surrender of books, papers and other documents.

The purchasing officer should be fully protected in the discharge of his official duties, and he should not be personally liable to damage suits for actions that he may take under the purchase laws. He will, of course, have the authority to appoint such deputies and employees as he may deem necessary to assure the efficient performance of his duties, and to fix the salaries of his staff members within the amounts appropriated. There should be ample provision for his necessary traveling and other expenses, as well as those of his staff. His powers and duties should be assignable to his subordinates, with the possible exception of the power to waive competitive bidding, to sign contracts, to debar any person, firm or corporation from public bidding, and to waive the requirements of the law in cases of emergency.

Scope of Authority

The purchasing officer should be further authorized by statute:

- (1) To gather together the requirements of all government departments, institutions and other agencies in the state for (a) articles, equipment, materials, and supplies, including printing, and (b) for contractual services and rentals and leases of land and buildings.
- (2) To classify such requirements into groups or classes.
- (3) To establish standards and standard specifications so far as is feasible for such contracts or purchases.
- (4) To determine (a) what commodities and services shall be contracted for by the state purchasing officer, and for whom; (b) what commodities and services, if any,

are to be contracted for or purchased directly by the respective state agencies for their own use, under the standards and rules of the Division of Standards and Purchase; (c) what contracts and purchases, if any, are to be made directly by state agencies under exemptions from such standards or rules.

(5) To require that all purchases shall be made only on requisitions approved by him, and with complete authorization to revise such requisitions as to quantity, quality or price—revision as to quality to be made only in accordance with his standards and specifications.

(6) To permit the allowance to a state agency of a quantity of any stated commodity or service which will suffice for only a part of the period covered by the estimate or requisition, and then to make additional allowances during such period in his discretion. Conversely, to increase allowances beyond the quantity required for a usual contract or fiscal period.

(7) To control, in the public interest, the ultimate quantity, quality, price, delivery, disposition and use of all commodities and contractual services purchased or acquired or used by the state.

(8) To control, in the public interest, the ultimate cost of all such commodities and contractual services, through control of incidental expenses, including the cost of rentals and leases.

(9) To control the acts of all state officers and employees in matters of standardization and purchase, through control of all expenditures for such purposes, made by or for a state officer, department or agency. This jurisdiction should apply to all available funds, regardless of the source, except as specifically exempted from the purchase authority.

(10) To establish rules and regulations governing all matters within his jurisdiction subject to the approval of the Governor.

(11) To suspend provisions of his own rules in particular instances having to do with forms or routine procedure, or to correct an unintentional error, within stipulated limits.

(12) To waive the requirements of law in emergency, with the approval of the Governor.

Since there must be reasonable latitude in the operation of any statute, the purchasing officer should be authorized to purchase or contract for commodities and services without calling for competitive bids,

within an amount not exceeding \$1,000; but there should be a stipulation limiting, within a given period, the aggregate of such purchases from any one source of supply, of any one kind or class, and for all state agencies.

Within these limits, the purchasing officer should be permitted to authorize, by rule, similar contracts or purchases by any state agency without competitive bidding, within a maximum figure restricted to \$500.

Advancement of Funds

If the finance laws of the state permit the advancement of funds, the purchasing officer should be authorized to certify what advance-



ment, if any, should be made to each state agency for such commodities or contractual services as have been centrally contracted for; and, in his discretion, to recommend a specified sum as a contingent fund for a definite period, including an amount sufficient to enable the receiving agency to pay transportation charges and take advantage of cash discounts.

Employment of Labor

As a rule, the purchasing officer should have little to do with labor problems, aside from complying generally with relevant statutes, since contracts for construction and public works are presumably not included under his jurisdiction. State and local ordinances will undoubtedly govern the delivery and installation of equipment, so that he must stipulate in his contracts that labor used in connection with the delivery or installation of purchases shall be employed in conformance with existing laws and paid not less than the prevailing rate of wages for the work performed. A similar provision should apply to all service contracts. Whether the stipulation should extend to the manufacturing and processing of the commodities purchased would depend entirely on the laws applying to these fields.

The states differ greatly as to the scope of centralized purchase jurisdiction, and their plans seldom include all government purchasing. The general practice is to set up partial control, which may be somewhat grudgingly extended on indisputable evidence that the system is functioning in the public interests. This reluctance would be more understandable if it followed a definite pattern as to what should and should not be included under purchase jurisdiction. But the very commodity, or group of commodities, reported to be efficiently centralized in one locality is excluded by another, while the Federal Government is probably buying all of the excepted items under a comparable system.

Variation of Policy

In some cases, however, particularly in the purchase of food, clothing, and medical supplies, there is honest difference of opinion. Pennsylvania excludes some groups of food supplies, yet foods were listed on the first centralized schedules issued in New York State sixty years ago, and approximately two hundred million pounds of food are now purchased annually through the central purchasing division. With the possible exception of buying day-old eggs and some home grown fresh fruits and vegetables, there has never been any reason to doubt the advisability of this procedure, and it has been found that even these items can be purchased advantageously for urban centers through centralized purchase based on proper specifications, inspection and planning.

New York hedges the purchase of medical supplies with restrictions, yet other government agencies report these as among their most successfully standardized commodities, with proportional savings in excess of those effected in any other class of purchases. No possible reason is apparent for the exclusion of clothing or the materials for clothing, from centralized purchase jurisdiction, for certainly in this field competition is keen and standards are easily established.

Very few of the state statutes place the public school systems under the jurisdiction of the state purchasing officer. North Carolina, however, requires that purchases of textbooks, supplies and materials for schools shall be made through the State Division of Purchase and Contract.

In Pennsylvania, where purchasing authority is lodged in the Department of Property and Supplies, the department is authorized to take over, maintain and operate state-owned automobiles, and to supply them with oil, gasoline, tires, service, and repair parts. Chauffeurs are hired by the departments and assigned as needed to state agencies and members of the Legislature. The department has authority to erect, rent, or lease garage space, to contract for purchases as noted above, to service cars generally, and to require detailed monthly reports from every using agency of costs, operation, mileage, and the persons by whom cars are used.

Custom, expediency, and division of labor and responsibility within the reasonable assurance of capable performance must be considered in planning centralization. It is necessary to determine just where centralized purchase jurisdiction under one head may cease to be efficient, and to take note of that point in planning the statute. Another possibility is that too great concentration of purchasing power may encourage monopolistic practices; whatever the merit of this argument, the threat, too, deserves thoughtful analysis.

Real Estate Purchases

Reason seems to indicate the wisdom of a division of responsibility, with actual purchasing and all of its related functions placed under the state purchasing officer, and with the purchase of land and buildings, construction and public works, under separate jurisdiction. The purchase of land and buildings is sometimes made by committees under special statutes or authorizations of legislative origin. These projects involve long-term policy, and deal primarily with real estate, architecture, and appraisals of construction and real values, rather than with situations with which an officer in charge of commodity purchasing is presumably familiar.

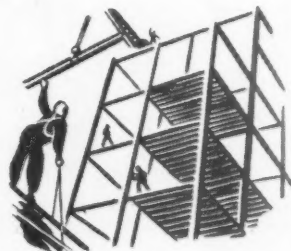
A distinction must be made between contracts for the purchase of land and buildings and contracts for the rental, lease and custodial care of land and buildings. The latter includes contractual services, as well as the purchase of furnishings, equipment, materials and supplies. The jurisdiction of the purchasing officer should, therefore, extend to all contracts and agreements to rent or lease, and to establish and maintain offices and warehouses for the

conduct of the state's business. He should have access at all times to all buildings and premises wherein the personal property of the state is located, stored or serviced, except as specifically exempted from his jurisdiction by statute.

Construction and Public Works

Contracts for construction and public works involving the completion of a project by a commercial contractor, with hired labor as a major item of expense, present some of the problems already mentioned, and many additional ones. Similarly, therefore, it may be advisable to place such work under separate functional jurisdiction.

But construction, repair and maintenance work performed by the state with its own employees and wards, using its own materials, should be included in centralized purchase jurisdiction, even though commercial contracts for such work are excluded, as previously noted. The distinction is that in the former case the state pays directly for the materials used, and does the work with little, if any, paid labor other than that of its regular employees, while accepting full responsibility for the satisfactory completion of the work. The presence of incidental "outside" labor is not sufficient cause to remove this category of construction from the purchasing officer's jurisdiction.



Construction contracts awarded to commercial contractors properly should be limited, by agreement or statutory requirement, to actual construction and to built-in equipment installed by the contractor's workmen or with their skilled help. All other equipment should be purchased through the Division of Standards and Purchase, in order to promote competition in a properly competitive field and for reasons of economy. The purchase of desks and their installation, for example, should not be included as a part of a building contract, but should be bought from the manufacturer or his agent by purchase contract.

The rental and lease of equipment, as well as outright purchase, is properly a matter for the purchasing officer to handle. Some companies make a practice of renting and not selling their equipment. A suspicion occurs that sometimes this is done in order to evade the requirements of competitive bidding. There may be little that the purchasing officer can do about it, when this is the standard trade custom of the seller, but where such procedure applies only to government purchasing, it becomes discriminatory and subject to protest. While expert service may be featured as inherent in such contracts, the service may actually consist only of ordinary repairs and upkeep. Through such agreements the state can be mulcted of many times the purchase price of a piece of equipment without ever acquiring ownership.

The term "contractual services" is broad and inclusive unless specifically qualified. Centralized purchase jurisdiction should extend to all such contracts, and requisitions should be cleared through the purchase division. Economy may in this way be attained through standardization, and the knowledge acquired by a few may be utilized for the benefit of all state agencies. While the schedule of rates for such services as heat, light, power, water, telephone, and telegraph may be more or less uniform, savings and economies conceivably can be effected even here, particularly through the exercise of fiscal control. There are many other types of services on which competition is readily available, even though occasionally a special procedure is necessary as to competitive bidding.

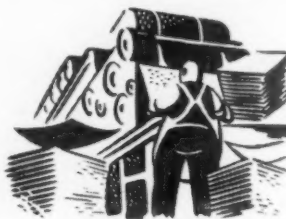
Printing and Paper

Printing, while involving labor as a major item, lacks the performance hazards of construction and public works contracts. Purchases and contracts for printing and printed materials should follow in detail the routine established for purchasing in general.

The theory that contracts for printing must be general, indeterminate contracts, awarded by class for a long period of time, is not well founded. Term contracts can be awarded for much of the state printing, to expire automatically with full delivery of the specified requirements, and additional contracts awarded as necessary to take care of unlisted items and overages in quantities beyond

the amount of contract tolerances. Other contracts must necessarily be "spot" contracts, but every effort should be made to correlate the requirements periodically — even monthly, if a longer period is inadvisable.

Purchase jurisdiction should extend to all printing, binding, ruling, lithograph, offset, folding, stitching, trimming, engraving, engrossing, and similar processes comprehended within this classification or commonly referred to as printed matter. Such jurisdiction should include control of standardization, since standardization of printed matter requires authority to condense, revise, simplify and unify as necessary to produce economy of administration. Furthermore, cooperative standardization of all state forms and record-keeping is a necessary preliminary to standardization of ordinary utility and supply printing.



No excuse presents itself for taking state printing out of legitimate trade channels and setting up the state in competition with private industry, except as an economy or as an opportunity for employment of the wards of the state. Economies can be effected by the pooling of addressograph, multilith, multigraph and similar printing equipment in given areas, and by doing such processing centrally for state agencies. All printing should be produced, as well as purchased, in accordance with the standards and specifications and with the applicable rules and regulations of the purchasing officer.

It is optional whether the distribution of public documents and other printed publications is assigned to the purchasing officer. Whoever is responsible for such distribution should have the custody of all documents and publications subject to public distribution. The sale of all such documents and publications should be made legally, under the most advantageous conditions and at the best prices obtainable.

The purchasing officer will, of course, have control of all purchases of printing equipment in the same

manner as of other types of equipment. It should be a fixed policy, however, that before any printing equipment can be purchased by the state, a resultant expectancy of economy and efficiency must be clearly demonstrated. Such foresight will obviate the duplication of facilities in state offices, and the strong possibility that both equipment and personnel may be overworked in some cases while in others they are to a considerable degree idle.

Paper and kindred supplies, whether needed for printing or other use, should be included in the regular supply schedules of the purchase division. Since, however, expert advice and service are available in the Bureau of Printing, it may be advisable to handle this line of purchases through that bureau.

Industrial and Home Products

The same record, control and responsibility should apply to state "home" products, whether manufactured or raised, as to purchases. Needless to state, the statutory authority to revise requisitions as to quantity will be of no value if quantities can be supplemented indefinitely by the addition or use of "home" products. Requisitions cannot be revised properly without knowing what additional products of like kind, or for a similar purpose, are available to the agency.

Since it is essential that all products and commodities used by state agencies shall be of a proper quality and price, the purchasing officer should have a voice in planning and controlling industries in the various institutions, and in pricing and distributing the industrial products made there. He should cooperate with the officials in charge of such industries and with the customers who are to use the products so as to (a) ascertain needs of customers and create markets for goods produced; (b) develop state resources; (c) establish such new industries as may be feasible; (d) discontinue such industrial production as is not feasible from the standpoint of costs, demand, markets, or occupational therapy; (e) improve or change commodities in production to meet the needs of customers; (f) prepare for proper handling, distribution and sale of such products; (g) price the products at competitive market levels; and (h) permit credit transfers between state agencies in the amount of the selling prices.

(Continued on page 280)



BIG JOBS need BIG MEN

Purchasing must measure up to the new responsibilities of a fast moving era in industry, and purchasing men must measure up individually to the larger concept of the procurement job

By RICHARD WHITMAN

IT is well known that the purchasing profession has done a splendid job in connection with the war effort by keeping thousands of workers supplied with the necessary material to maintain production schedules. Men like Donald Nelson have said the War Production drive could not have reached its present tempo without the knowledge, fortitude and hard work of the Purchasing Agents in industry and government (Army, Navy, etc.)

Thus as a group, Purchasing Agents can be justly proud of their accomplishments during the stress of unprecedented production for war.

On the other hand, how about the individual? How about you?

Self Analysis

You can, by the process of deduction, conclude: Purchasing Agents are efficient, therefore, I am efficient. Purchasing Agents are important cogs in the industrial machine, therefore, I am an important cog in the industrial machine. But are you? Self appraisal is good for the soul but like so many things that

are good for us, we find they are not sugar coated and therefore avoid them.

At this point, if you wonder why anyone should ask you to make a critical analysis of your activities, let me relate an incident that occurred just recently. I was having lunch with a prominent business man and somehow we got around to discussing the relative efficiency of salesmen and Purchasing Agents. He readily agreed that people in selling were not perfect and that there was vast room for improvement. What interested me most was his comment concerning buyers. He said, "I have noticed in some cases there seem to be 'little men in big jobs'."

This man said that he wasn't prepared to say why the condition existed. It could either be the fault of management for failing to recognize the importance of the procurement function or of the individuals doing the buying for failing to measure up to the job.

This man did not offer the comment as an indictment of Purchasing Agents in general. I point-

ed to the job already accomplished by Purchasing Agents, but was willing to concede there must be some room for improvement as business itself is not static and that which doesn't move forward generally falls back. If you will agree that none of us is perfect let us examine some of the problems facing buyers and see how they can be handled.

The Open Mind

First, do we have an open mind? Are we of executive calibre? Are we "Men of Parts"? Professor Erwin H. Schell of M. I. T., in his stimulating book, *"New Strength For New Leadership"* describes the "Man of Parts" as "The person who is endowed with a happy balance of faculties and ample physical resources, whose upbringing has stimulated a wide range of interests, whose education has provided the skills essential to accomplishments." In short, men "of natural and yet diverse abilities—men of parts."

A sales executive told me recently one difficulty he had was trying to convince buyers the service he offers (engineering talent, reports, analysis, etc.) has no strings attached. Naturally he wants to sell his product and he realizes the product must do the job and be competitive in price, quality, etc. On the other hand, he is sincere in his belief that the service will be beneficial to the buyer and yet some buyers seem unwilling to recognize the possible advantages.

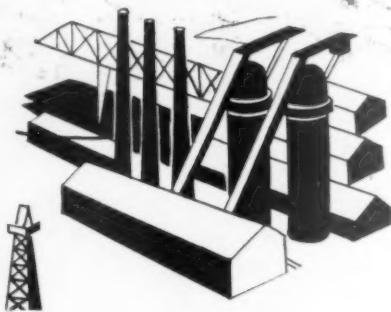
Another fault found occasionally, is the buyer who assumes he knows all the answers. Some specialists may be experts in the individual items they purchase but most buyers of industrial products cannot possibly know it all. The buyer would have to be a walking encyclopedia. The buyer who is a "Man of Parts" will readily admit he doesn't know it all and will put it right up to the salesman to give him honest, straightforward information. In practically every case, the salesman who is entrusted with such an assignment will put forth extra effort in securing the proper data for the buyer.

Active Curiosity

Our purchasing "Man of Parts" will have unbounding curiosity. Today and in the post-war period many new materials and processes will be offered to industry. Much will be offered through the purchasing department. Fortunate is the

concern that has buyers capable of exploring and analyzing the hundreds of ideas presented each year and skillful enough to pick out those which have possibility and pass them on for additional consideration. It may be disastrous for the company who has a buyer who is not curious, who will not give every visitor a chance to tell his story, and who is unable or unwilling to separate the wheat from the chaff. Through the portals of the purchasing department will come the riches of the world—some obvious, some cloaked in dark raiments which the buyer must be able to tear aside to find the gold beneath.

In short, buyers must have a lively sense of curiosity. They must possess a driving urge to *know—to find out*. Purchasing curiosity has always been a vital factor in the intensive and continued development of a business—no relaxation



is permissible. Do you know how the items you purchase are actually used? Are you familiar with each item, or are they just names on the requisition? I know one Purchasing Agent who has his buyers look up unfamiliar items in catalogs so they will have a clear idea of what they are buying. Of course, buyers should make frequent visits to vendors' plants to see how things are actually produced. We have heard Purchasing Agents say they have been unable to secure a traveling budget sufficient to allow for such trips. Fortunately the last few years has changed this for many purchasing departments. Let us be prepared to hold our gains in this direction.

Who Is Responsible?

Our purchasing "Man of Parts" will be inventory conscious. From now until "V" day eternal vigilance will be necessary. We must try to avoid substantial inventory losses so that the transition from war to peace will be as smooth as possible.

We occasionally hear the buyer say, "I am not responsible for inventories; that's up to the production and planning department. I buy the quantity on requisition." A "Man of Parts" will recognize he has a responsibility regardless of what the organization charts say.

The chairman of the finance committee of one of America's largest industrial organizations once remarked that the purchasing department was the final outpost through which company funds flowed. He said the buyer who signs the order is responsible for all the details of the purchase regardless of who developed the data.

Some buyers will say they don't have time to analyze every item. The "Man of Parts" will train himself so that he can quickly spot those items that may be wrong and then take the time to have a thorough analysis made.

New Opportunities

Regardless of the degree of responsibility of the buyer, management cannot help but look to the buyer for the answer when raw material surpluses develop. They may not blame the buyer for the condition, but they will think a lot more of him if he contributes toward the reduction in inventory losses. Few companies can expect to reach the end of the war without any loss whatsoever, but an alert purchasing department can keep the losses at a minimum. Management never seems to overlook the fact that you—the buyer—signed the order for the material which is now obsolete or surplus.

Today the Purchasing Agent is on the threshold of a new era. The war has thrust procurement to the forefront. Management is more conscious of the importance of buying than it has ever been. If we as Purchasing Agents are going to maintain our position, we must look upon our past record as a starting point from which to do a more intelligent, efficient job. We must consolidate our gains and then move forward to greater heights. This isn't poetry—it is a challenge. We must rise up to meet it. If any of us are "little men in big jobs" let us resolve to become "Big Men," "Men of Parts". If we fail, our jobs may become little jobs. Industry in general, and Purchasing Agents in particular, cannot prosper if little men make up too great a percentage of the whole. America is going forward led by "Men of Parts". Will you join in leading?

HOW MODERN COURTS INTERPRET PURCHASE CONTRACTS

By LEO T. PARKER

Lower court decisions were reversed in several of the cases here cited, showing that even judges may disagree. Be sure to follow the interpretations of the higher courts on contract law.

VERY frequently modern higher courts render unusual decisions. In other instances their explanations of modern law are interesting and informative, particularly with respect to contracts for the purchase of merchandise. Therefore, in this article we shall review certain late decisions having special interest to Purchasing Agents.

A source of continuous, commonplace and numerous litigations arises from representations made by salesmen. In fact considerable controversy has existed from time to time over the answer to the legal question: When and under what circumstances may a salesman or agent make a valid and binding contract for his employer? The answer is: Never, unless the salesman has implied or expressed authority to bind his employer.

Obviously, therefore, a "contract" taken by a salesman merely is a legal proposal or offer of the purchaser to buy the stipulated merchandise. If the salesman's employer fails to

"accept" the offer, generally, no enforceable contract exists. But a modern higher court has held that if the seller fails to acknowledge or accept an order or contract sent in by a salesman, still a valid contract may be completed if the seller ships all or a part of the merchandise which the purchaser accepts.

Shipment Implies Acceptance

For illustration, in *Ludowici-Celadon Company v. McKinley*, 11 N. W. (2d) 839, reported January, 1944, it was shown that a seller computed with a purchaser the quantity of tile roofing necessary to complete certain jobs of the purchaser, who was a contractor. It was mutually agreed between the purchaser and the salesman that the amount of tile required would cost \$2,526. A proposal to furnish the tile at the agreed cost of \$2,526 was signed by the purchaser and the salesman, which contained the following language: "This proposal is good for thirty days. Its acceptance will constitute a contract, subject to the approval of our executive department at Chicago." Subsequently the purchaser received a letter from the seller which read: "We acknowledge, with thanks, receipt of our proposal dated April 14th, signed. We are passing this to our Executive Department for consideration and attention." Nothing further in writing was received by the purchaser from the seller. In other words, the seller did not accept the "proposal" or offer of the purchaser, but proceeded to ship the tile. On August 20, the purchaser was billed \$1,356.30 for tile that had been delivered, and on October 23rd he paid the seller \$1,000. On October 28th he was billed \$75.26 for other

tile, and on November 25th he paid \$356.30, and on December 23rd, \$75.26.

Either the parties over-estimated the amount of tile required or there was not as much breakage as was anticipated. In any event, the seller had remaining in its hands specially manufactured tile, of an outmoded style, for which he had no market and which was not needed by the purchaser. The latter refused to accept delivery of other shipments of tile and the seller filed suit for \$1,000.

The purchaser, knowing the elementary principles of law, contended that he was not liable because the seller had not accepted nor formally acknowledged the order sent in by the salesman and, therefore, no valid contract was completed.

Lower Court Reversed

The lower court agreed with this argument and held the purchaser not liable. However, the higher court reversed the verdict and, in holding the purchaser liable in full damages for failure to accept and pay for the complete \$2,526 worth of tile, said:

"In the instant case, plaintiff (seller) manufactured the tile, delivered a part thereof, and tendered the remainder. Had the seller refused to deliver the remainder, the buyer could have recovered damages for the breach of the contract. It must, therefore, follow that the seller is likewise entitled to recover damages because of the buyer's refusal to accept the remainder of the tile. . . . The law is settled that the shipment of a part of an order of goods is an acceptance of the whole order."

This higher court also stated important law, as follows: "The written proposal was 'subject to the approval' of the executive department of plaintiff (seller). When he manufactured the special tile and



shipped a portion thereof to defendants (purchaser), such acts and conduct constituted an approval of the proposal."

In other words, according to this decision a seller need not, to complete a valid contract, accept an offer made by a buyer to purchase *specially* manufactured goods. If the seller begins to manufacture the goods especially for the purchaser, a valid contract is completed at that moment. However, it is doubtful that other higher courts may strictly adhere to this law, unless the testimony proves that the seller performed some act or gave the purchaser a notification or letter which indicated that he *intended* to manufacture and ship the goods.

Both Parties Are Bound

A somewhat comparable situation is disclosed in *Columbia Weighing Machine Company v. Vaughan*, 123 Kan. 474. In that case a purchaser signed an order for a weighing machine, and included in the order was this statement: "It is understood you (seller) are to supply us with any mechanical parts required for the machine for a period of five years without charge. Whenever we may want a part, we are to inform you by registered mail. . . . All orders are subject to acceptance of the company."

No letter was written by the seller to the purchaser accepting the order, but the seller shipped the machine.

When suit was brought to recover the purchase price, the purchaser interposed the defense that his offer had not been accepted by the seller so as to become a binding contract to also furnish parts for five years without charge. This court held that legal "acceptance" may be shown by any act or conduct clearly evincing an intention of the seller to accept the offer made, and that delivery of the merchandise ordered clearly evinces the intention to accept. It was held that the offer was not divisible with respect to the mechanical parts required, and that, when the purchaser accepted the offer, it was accepted in its entirety, and that it could not be accepted in any other way. Therefore, it was held that both parties became bound by all the conditions and provisions of the written offer.

Seller Not Liable On Guarantee

Modern higher courts consistently hold that letters written by an agent or salesman are not admissible in evidence against his employer un-

less they were written both in discharge of the agent's duties and within the scope of his powers or authority. In other words, no salesman may vary the terms of a contract of sale, unless such salesman has expressed or implied authority to make contracts of this nature for his employer.

For example, in *Frick Company, Inc., v. Smith*, 27 S. E. (2d) 795, reported December, 1943, it was shown that a seller sued a buyer to recover the purchase price of certain machinery. During the trial the testimony proved that the contract of sale was in writing and contained a clause which specified that the salesman had no authority to bind the company by any agreement not contained in the contract, nor to alter the contract after it had been accepted by the seller.

The purchaser defended the suit on the grounds that the machinery was not satisfactory, and that it did not conform with the guarantee made by the salesman in a letter mailed before the sale contract was signed.



The lower court held in favor of the purchaser in view of the fact that the machinery did not conform with the guarantee specified in the salesman's letter. However, the higher court reversed this verdict, and said:

"All prior negotiations with respect to the sale of the machinery were merged into the written contract entered into between plaintiff (seller) and defendant (buyer), and it was not permissible for the defendant to prove that the plaintiff's agent made any other warranty or representations with respect to the property than those contained in the written contract of purchase."

Still another important point of law, involved in this case, relates to implied guarantees. It is well established law that a seller may be liable on an "implied" guarantee that the merchandise is reasonably suitable for the intended purposes of the buyer providing the seller knew the intended uses of the merchandise and, also, providing the seller did not expressly guarantee the goods. In the above case the testimony proved that in the written contract of sale the seller guaranteed the machinery to produce certain and definite results. Although the purchaser contended that the machinery was not suitable for his intended purposes, of which the seller was informed, the higher court refused to invoke the "implied" guarantee, saying:

"When a contract contains an express warranty, as the one in the present case does, it is error for the court to charge the jury on the law as to implied warranty."

Purchaser Forfeits Rights

Another important point of law, relating to guarantees, is that a purchaser may forfeit his legal rights under a written guarantee by a failure to comply *strictly* with his agreement to notify the seller of defects, within a predetermined period, or continuing use of the merchandise after knowing that its quality does not conform with the written guarantee, or neglecting to return the merchandise to the seller within a specified period of time after discovering defects.

For example, in the leading case of *Bridges*, 51 Ga. App. 123, 179 S. F. 861, 862, the court held that a purchaser cannot prove that a machine, or other merchandise, does not conform with the terms of a written guarantee unless he has complied with the terms and conditions stated in the contract.

In other words, if a sale contract contained an express warranty as to quality, and, by the terms of the contract liability of the seller for the breach of such warranty is *predicated upon conditions* which must be performed by the buyer, the seller will *not* be held liable on the warranty thus limited unless the buyer complies with the conditions therein set forth.

Many contracts of sale contain clauses to the effect that the purchaser agrees to notify the seller within a specified number of days after discovering defects in the merchandise. Other contracts provide that the purchaser will return de-

fective merchandise within a specified period of time after first discovering any defects; or if the merchandise does not comply with the warranty the purchaser will give written notice to the seller by registered letter within five days from the day the goods were first used, explaining in what respect the merchandise fails to perform.

Purchaser Must Comply

In other instances contracts of sale contain a clause which provides that if merchandise is used *at all* after the seller is notified and fails to *remedy defects* the purchaser automatically becomes obligated to pay for the merchandise. In fact various provisions of this kind are numerous and varied. Almost all contracts contain some or all of these provisions.

Therefore, it is important to know that failure of a purchaser to *strictly* conform with any of these various provisions automatically *relieves* the seller from compliance with the terms of his guarantee.



Moreover, by such failure to comply with the provisions the purchaser may be compelled to pay the full purchase price, irrespective of the poor or deficient quality of the merchandise. For verification of these various statements and explanations of law, see the higher court cases, as follows: *Case Threshing Machine Company v. Cook*, 67 S. E. 890; *Belle City Manufacturing Company v. Palmer*, 53 Ga. App. 431 (1); *Neon Lights Advertising Company v. Briggs*, 3 S. E. (2d) 113, and *Dilton*, 55 S. E. 1034.

Exceptions To Rule

Notwithstanding the above explained usual law, circumstances of fraud may exist under which a purchaser may rescind a contract and

recover from the seller full payment of the purchase price, plus damages, although he failed to comply with special clauses in the contract, or provisions of a valid law. This condition arises when the testimony proves that the seller, or his salesman, used fraud or deceit to induce the purchaser to enter into the contract of sale.

For illustration, in *Zingale*, 11 N. W. (2d) 645, reported December, 1943, it was shown that a state law provides that if a buyer fails to give notice to the sale of the breach of any promise or warranty within a reasonable time after the buyer knows, or ought to know, of such breach, the seller shall not be liable therefor.

Deceit by Seller's Agent

A person, named Zingale, was a young ex-prize fighter, who had no knowledge or experience in the manufacture of ice cream. A company is engaged in the manufacture of ice cream freezers, phonographs and other articles. Their salesman had known Zingale since 1923 and came to the Zingale premises several times, urging him to purchase a large ice cream unit and urging him to go into the business of manufacturing ice cream. The salesman examined the premises and suggested the small room to the rear of the store for an ice cream manufacturing room. This room adjoined a kitchen and toilet. Zingale believing that the room would be an ideal location to manufacture ice cream, purchased a large ice cream freezer, and other equipment, for the purpose of engaging in the ice cream business.

The freezer was installed, and after three months of operation, inspectors from the State Department of Agriculture and Markets and the City Health Department of the city examined the premises and ordered Zingale to discontinue operation unless extensive alterations were made, part of which were that they remove the toilet from the direct entrance to the ice cream manufacturing room. Zingale could not make these changes, and discontinued operation. He sued the seller to recover full value of the ice cream freezer and other equipment. However, Zingale did not notify the seller within a "reasonable" time of his intentions to rescind the contract, as required by the state law. Therefore, the legal question presented the court was: Since the purchaser breached the law requiring

him to give notice to the seller, can the purchaser recover damages from the seller? In holding in the affirmative the higher court said:

"Liability could exist for damages for fraud or deceit on the part of a person who made no sale or was not a party to a completed contract. The damages arising in this instance are in no way occasioned by any breach of warranty but for deceit of the seller's agent."

Legal Rights of Purchaser

The general rule of law is that, in case the terms of the sale are breached by the seller, the buyer has several remedies. For illustration, he may either (a) affirm the sale, notwithstanding the seller's breach, and proceed to carry out his part of the agreement; or (b) he may rescind the sale contract and return the merchandise already received and recover anything already

MORE IMPORTANT THAN THE \$64 QUESTION!

Does an error of calculation relieve the buyer from accepting the full quantity of an order?

What is the binding force of an order that has not been formally acknowledged, but against which shipments have been made?

How long is a "reasonable" time for reporting that deliveries are unsatisfactory?

When is the salesman's acceptance of an order binding upon his employer?

Does shipment of an order imply acceptance of all terms of the order?

Under what circumstances does the buyer forfeit his rights under the seller's guarantee?

Who owns the goods when a purchaser sues and recovers the purchase price?

paid on the purchase price; or (c) he may affirm the contract and if he has been damaged by the breach of the contract by the seller, he may set off the amount of such damages where the seller sues for the balance of the purchase price; or (d) he may sue the seller for full damages. The purchaser must, however, elect between these various remedies and is bound by his election. But modern higher courts hold that if a purchaser retains the merchandise previously shipped to him he cannot refuse to carry out his part of the agreement, although he may recover full damages caused him by the breach on the part of the seller.

For illustration, in the leading higher court case of *California Products Company v. Wadlow*, 118 Pac. (2d) 67, it was shown that a company sold certain materials to a buyer for the sum of \$4,195. Legal controversy arose when the buyer became dissatisfied with the deal and attempted to rescind the contract on the grounds that the seller had made false statements to induce making of the contract and, also, that the seller had breached this guarantee of the quality of the materials.

Rescission or Damages

During the trial testimony was given by the buyer upon which the court relied and decided that the seller had not fulfilled his guarantee. Therefore, the court decided that the purchaser was entitled to recover back from the seller the full purchase price, plus all damages sustained as a result of the seller's breach of the warranty. This court said:

"If defendant's (purchaser's) evidence was clear and convincing that the plaintiff (seller) had committed the fraud alleged, then the verdict should be for the defendant."

Therefore, where it is shown that a seller has breached a guarantee of merchandise the purchaser may, within a reasonable time, either return or offer to return the merchandise to the seller and sue for a rescission of the contract, or he may elect to retain the merchandise, and sue for the damages. But he cannot recover his money and also keep the goods.

For instance, in *Automatic Equipment Company v. Mohny*, 174 S. W. (2d) 716, reported November, 1943, a purchaser sued a seller on a guarantee and recovered a judgment against the seller for the

money paid on the goods. The court promptly held:

"In the case before us the buyer has a judgment for the purchase money paid and the judgment contains no provision for a return of the goods to the seller. The buyer may not keep the goods and recover the purchase money paid but must return the goods or account satisfactorily for their non-return."

Seller Liable

A seller always is liable in damages where merchandise is sold under a false guarantee. Moreover, if a purchaser purchases guaranteed materials the law does not expect him to make immediate complaint that the guarantee is breached by the seller.

For example, in *John Company v. Williams*, 46 N. E. (2d) 1, it was disclosed that on October 20 a man, named Williams, by letter, offered to sell to a manufacturer a quantity of composition soles, explaining that they were in "original cartons, in good condition and a good run of sizes". Samples were sent to the manufacturer by Williams. On the following day the purchaser, by letter, purchased the soles and paid for them in accordance with his undertaking.



The soles were delivered about November 5, but the manufacturer did not complain of the poor quality until 19 months later. This was so because he continued to use the soles in the manufacture of shoes for over one year until all of the soles were used. About five months after the last of the soles were used, or nineteen months after the soles were delivered by Williams to the manufacturer, the latter received complaints from its customers that the soles were breaking, and were defective.

The manufacturer sued Williams for damages and proved that he had the soles in stock about four years before selling them.

Further the manufacturer proved that soles of this character should be stored in a well-ventilated, cool room, out of sunlight, if not to be used in a short time, and that if they are not kept in such a room, they will deteriorate rapidly.

The lower court considered all testimony and held Williams liable to the manufacturer for heavy damages and explained that a purchaser need not complain of a breached guarantee until he knows that the seller's guarantee actually has been breached. This court said:

"The defendant (seller) made his offer in writing stating that the soles were in original cartons, in good condition. It is not contended that they were not in original cartons, but the fact that they were is not to be overlooked. He also wrote that the soles were a 'good run of sizes'. It cannot be said, in all the circumstances, that he did not intend to convey to the plaintiff (shoe manufacturer) his assertion that the soles were in condition for use in the manufacture of shoes, and, by the same token, it cannot be said that the plaintiff was not justified in taking him at his word."

Opinion vs. Fact

Also, see the leading case of *Milliken v. Thorndike*, 103 Mass. 382, where it was contended that the alleged misrepresentation was made by a seller. The latter argued that his statement or guarantee was not of such character that the purchaser should have relied upon it. The court said:

"If a statement is honestly made as a matter of opinion, judgment or estimate, it is not in law a false representation, although the matter thus stated should turn out to be untrue. But if a fact which is susceptible of knowledge is stated by a party as of his own knowledge, and such representation is relied upon as the basis of a contract, and damage results to the party deceived, it is a legal fraud, the consequences of which must be borne by him who makes the statement."

Modern higher courts, also, hold that a seller is guilty of fraud if he knows something important about the merchandise he is selling and keeps silent with the ultimate result that the purchaser is deceived to his disadvantage.

Submarine "Flying Fish" Makes Record Catch

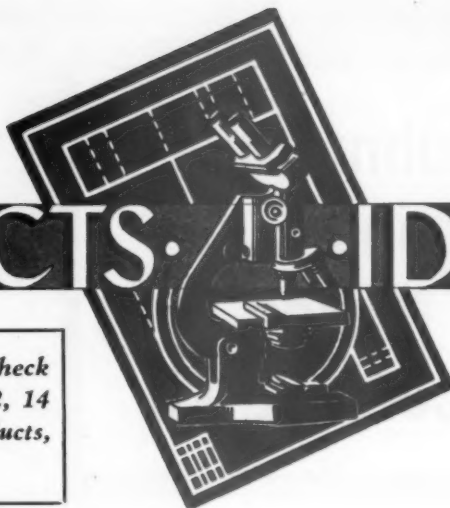
The skipper took one look through the periscope—and what happened is Naval history. The U.S.S. "Flying Fish" was commissioned on December 10, 1941. A few days later she slid into enemy waters to set the highest sinking record in the Pacific—100,000 tons, including three warships sunk and many others badly damaged. That's the outstanding record of the "Flying Fish" and her efficient crew. Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago 5, Illinois.

Powered with FAIRBANKS-MORSE DIESELS

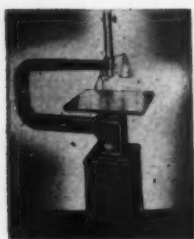


New PRODUCTS IDEAS

Purchasing Agents and their Assistants are invited to Check the Coupons on the "Know-How" Pages, Nos. 10, 12, 14 and 16, for late catalogs and bulletins on New Products, Materials, Finishes, Equipment, etc.



HEAVY-DUTY JIG SAW



JIG SAW with universal full-duty blade chucks that take blades from 5" to 9" long and die files is being offered by Boice-Crane Co., 953 Central Ave., Toledo, Ohio. Known as the DeLuxe heavy duty 24" x 5" jig saw, it can be used for sawing and sanding metals, wood and plastics fast, clean, accurately and without vibration, according to the manufacturers. 20" x 20" oversize, polished, cast iron work table tilts both ways 45 degrees. Bevels of 45° can be ripped on long lumber.

SYNTHETIC RUBBER CUT-OFF DISCS

NEW synthetic rubber cut-off discs and grinding wheels are announced by A. P. de Sanno & Son, Inc., Phoenixville, Penna. Manufacturer states case histories have shown that the synthetic units are superior in many respects than crude rubber discs and wheels. Wheels and discs are made in the standard range of thicknesses and diameters up to 20". Trade name of the new line is Radiac.

FRICTION CLUTCH



NEW friction clutch styled the Rolling-Grip friction clutch, is announced by Dodge Mfg. Corp., Mishawaka, Ind. It is designed for use where power requirements are relatively small. It comes with a 3½" diameter disc rated at ½ hp at 100 RPM, or with 4½" diameter disc rated at 1 hp at 100 RPM. Clutch can be easily adapted to any required operating condition. There are no exposed operating parts.

DO-ALL BUTTRESS TOOTH SAW

DIFFERENT types of band saw, built along lines which are said to be a complete departure from all old sawing theories, is announced by the DoAll Co., Des Plaines, Ill., for the cutting of nonmetallic materials. It is called the Buttress Tooth saw. Saw teeth are permanently hardened and are not to be re-sharpened or reset. Tooth structure is sturdy and has ample gullet capacity for removing large quantities of chips. True alignment of set results in a cutting tool minutely balanced for long life and uninterrupted production. Saw can be used on any band saw machine.

RUNNING BOARD BRACKET



NEW bracket for fire-truck running boards to securely hold carbon dioxide fire extinguishers of two of the most popular sizes, is announced by Walter Kidde & Co., Inc., Belleville, N. J. It is strongly constructed of stamped steel. An adjustable quick-release latch clamps either size extinguisher firmly in place, with the bracket accommodating 10 and 15-pound capacity extinguishers, the diameters of which may vary from 6¼" to 6⅞". Bracket is about half as heavy as older models and will replace four different malleable iron brackets.

TESTS SPOT WELD TENSILE STRENGTH

ONE-minute operation on S-A tensile tester is said to give accurate and complete check on the tensile strength of spot welds on thin sheet metal, according to engineers of the Streeter-Amet Co., Chicago, makers of the machine. The machine will also check the strength of veneers and thin plywoods. Bulletin 2431M describes the equipment in detail.

HIGH SPEED FINISHING

THREE-M-ITE Cloth Evenrun bands for high speed finishing are available in 33 diameter sizes, ranging from 3/32" to 8", and with a face width of front ½" to 3", according to the Minnesota Mining & Mfg. Co., St. Paul, Minn.



Bands are said to be fast cutting and long wearing, and make for turning out tough jobs on a mass production basis, individual finishing jobs being a matter of seconds.

ANNOUNCE DIFFERENT CUTTING OIL COMPOUND

NEW cutting oil compound for use in cutting hard high-speed tool steels, chrome molybdenum, and the NE alloys, is announced by the Fearless Oil Co., Los Angeles 15, Calif. It is a mixture of animal oils and other chemical ingredients. It is claimed to increase tool life from two to six times before regrinding is necessary, increase production from 25 to 100 percent, cut down over-heating, and give excellent finish.

ALL PLASTIC GOGGLE

MONOGOGGLE announced by Willson Products, Inc., Reading, Pa. The goggle is designed to provide high impact strength, unobstructed vision and complete comfort. Weighing only 1¼ ounces the goggle has a replaceable, nonshatterable crystal-clear plastic lens and can be worn comfortably over pre-



(Continued on page 122)

SMOOTH



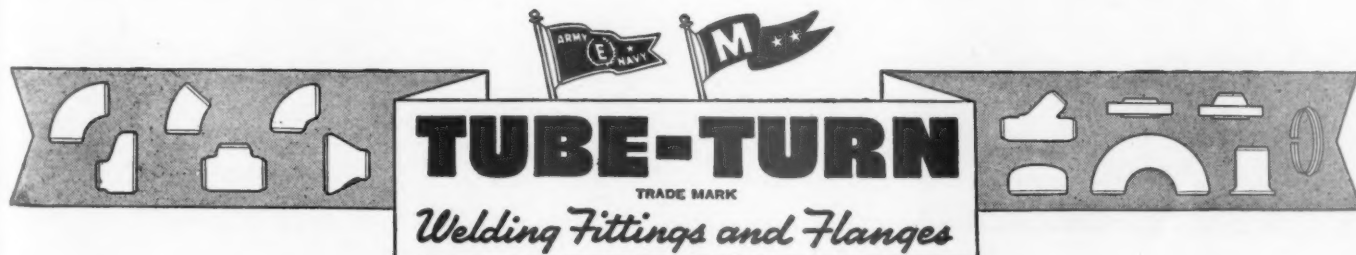
LIGHT-AND-SHADOW TESTS, shown above in Tube Turns' Inspection Department, instantly reveal any rough wall surfaces.

Smooth inner walls are vital in welding fittings. For waves, ridges or "pockets" retard flow, increase pressure loss and accelerate corrosive and erosive action. Absence of surface irregularities permits maximum operative efficiency, reducing maintenance

and extending the useful life of any piping system.

Tube-Turn welding fittings are *always* made with uniformly smooth inner walls. Continuous light-and-shadow tests *insure* this superior feature in all Tube-Turn seamless welding fittings.

TUBE TURNS (Inc.) Louisville, Kentucky. Branch Offices: New York, Chicago, Philadelphia, Pittsburgh, Cleveland, Dayton, Washington, D. C., Houston, San Francisco, Seattle. . . . Distributors located in all principal cities.





.. how do Willson safety products fit 'em all?

● Willson goggles, respirators, gas masks fit because Willson has studied faces. Taking account of facial variations, Willson designs its safety products so that, with only slight adjustment, they will comfortably fit any of the facial types in America's vast "melting pot."

Workers find Willson safety products unusually comfortable and wear them more willingly. Fit is a big reason why.

All Willson protection is scientifically engineered to yield the utmost in safety and comfort. That is why so many safety directors and purchasing agents specify Willson for head, eye and lung protective equipment.



WILLSON WELDING GOGGLES RW50
Composition cups molded to fit area around orbital cavity. Indirect ventilation. Willson-Weld lenses filter out harmful ultra-violet and infra-red rays.



GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

WILLSON
DOUBLE
PRODUCTS INCORPORATED
READING, PA., U.S.A. Established 1870

(Continued from page 120)
ELECTRIC PORTABLE SANDER



FLEXIBLE sanding pad is pointed out as outstanding feature of new Sterling 1000 electric portable sander, announced by Sterling Tool Products Co., 358 E. Ohio St., Chicago. Pad detaches from machine by simply pulling out a latch. When different grades of abrasives are used, pads loaded with coarse and fine grits can be switched as necessary. The sander is designed to cover the entire range of abrading from coarse sanding to lapping and finishing. At speed of 4500 oscillations per minute, vibration is said to be negligible.

RECLAIMING OIL SOAKED BELTING, ROPES, SHOES

A PRODUCT known as Speedi-Dri developed by Refiners Lubricating Co., 601 W. 26th St., New York, and Waverly Petroleum Products Co., Philadelphia, Pa., as an oil and grease absorbent for slippery floors, is said to be of value for reclaiming oil-soaked belting, ropes, shoes and clothes, for removal of oil from tools in the heat-treating process, and for the removing of oil film from metals that are to be painted.

LUBRICATING NOZZLE



FOR use in lubricating heavy gears or in chemical processes and other types of service, a new lubricating nozzle with special long-wearing, hardened steel orifice that produces a flat spray pattern, is announced by Spraying Systems Co., 4024 W. Lake St., Chicago, Ill. Clean-out needle construction makes it unnecessary to cease operation when orifice needs cleaning. Various capacities and spray angles are available.

COMMANDO MODEL RECORD-GRAPH

NEW recording device with name indicated, for recording conferences, telephone conversations, training purposes, control centers, and wherever permanent or temporary recording of sound, speech or code is desired, is announced by Amertype Recordgraph Corporation, 333 W. 52nd St., New York, N. Y. Provides for 5 continuous hours of recording or playing without media change. Permits instant location and playback of any portion of a recording.

EXTRUSION PRESS WITH WIRE-FEED

COMBINATION machine including laboratory type 12-ton hydraulic extrusion press and an automatic wire feed, occupying 2 x 4 ft. of floor space, has been developed by Moslo Machinery Co., Cleveland, O. While designed primarily for the extrusion of welding rods, the press may be had with dies for extruding powdered metals, carbon and certain plastics. The combination unit is so designed that the press can be sold without the wire feeding unit. Pressure of 10,000 lbs. P.S.I. on the material is achieved, which combined with the automatic wire feeding, makes the machine suitable for small scale production of welding electrodes.

MEASURING SPRING TORSION

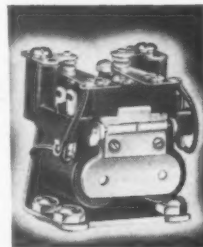


TORSIOMETER is the trade style of comparator announced by the Sheffield Corp., Dayton, O., for precision measuring of the torsion of small spiral springs. It is claimed that instrument will save from 5 to 10% of the labor assembling costs, as torsion of spring will be known when it is assembled. The device will accommodate springs up to 2 7/8" in diameter with a maximum torsion measurement of 49.5 millimeter grams. Capacity is said to be sufficient to cover the complete range of springs used in most instruments.

HEAVY DUTY OIL BATH FURNACE

COMPACT heavy duty oil bath furnace, Model 128, is announced by Stanwood Corp., 4819 W. Cortland St., Chicago 39, Ill., for tempering or drawing small parts to relieve stresses set up by quenching or to bring about a change in grain structure. Units are gas fired. Thermostatic control assures accurate temperatures. They can be equipped with right or left hand drain boards. Available in variety of sizes, as described in Bulletin 14.

DUAL COIL RELAY



SMALL power dual coil relay for use in plate circuits where the limited amount of current is insufficient to directly operate a single coil power relay is announced by the Allied Control Co., Inc., 2 E. End Ave., New York, N. Y. It is known as the model Boy. Dimensions are 1 3/4 x 1 1/2 inches, and the weight is five ounces.

(Continued on page 124)



Additions and Improvements for Greater Service

IN the five worst years of the Depression -- 1931 to 1935 -- The Youngstown Sheet and Tube Company spent over twenty-nine million dollars for "additions and improvements." Specifically, this meant new electric weld tube mills, improvements to seamless tube mills, new 79" continuous hot and cold sheet and strip mills, new alloy steel facilities, new thin wall conduit mills, new tin plate mills, blooming mill furnaces, railroad spike and tieplate plants, river coal loading equipment, ore mine improvements and many other projects to improve quality and further to diversify products.

How could Youngstown afford to invest so many millions in new equipment when the economic world-seemed desperate? Because of two vitally important things: First, because the company had been permitted -- under a system of free enterprise -- to earn and conserve profits which *could* be spent in bad times. Second, because under free enterprise the company could look forward with certainty to business recovery, when America would need vast quantities of steel again and would reward those producers who had the most efficient plants.

Typical of industries created and reared by Free Enterprise, Youngstown can continue to improve quality and further to diversify its products with additions and improvements, so long as enterprise remains free.

Historical Series . . . No. 12

TAPPING HEAT OF OPEN HEARTH STEEL

YOUNGSTOWN
THE YOUNGSTOWN SHEET AND TUBE COMPANY
 YOUNGSTOWN, OHIO

Manufacturers of
CARBON · ALLOY AND YOLOX STEELS
 Pipe and Tubular Products · Sheets · Plates · Conduit · Bars · Tin Plate
 Rods · Wire · Nails · Tie Plates and Spikes · Alloy and YOLOX Steels

3-M ABRASIVE BACKSTAND BELTS AND SEGMENT FACE CONTACT WHEELS

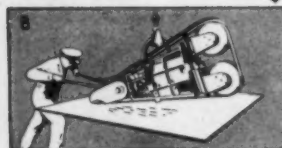
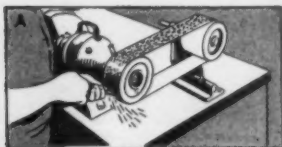


THE "SECRET WEAPON" OF FASTER FINISHING!

The Segment Face Contact Wheel with Backstand Idler and 3-M Abrasive Backstand Belt is no "secret" to hundreds of industrial concerns who use it to put faster finishes on irregular surfaces. The cushioned center of the Segment Face Contact Wheel shapes the grinding action to the contour of the surface being finished.

The scientifically controlled and uniform mineral coating of 3-M Abrasive Belts enables them to cut faster and wear longer at all speeds. Our booklet on the 3-M Method of Grinding and Finishing should suggest some money-saving ideas to you. A copy is yours on request.

A. Backstand Idler with 3-M Abrasive Backstand Belt & Segment Face Contact Wheel. B. Swing Grinder with 3-M Abrasive Swing Grinder Belt.



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GENERAL OFFICES SAINT PAUL 6, MINN.
BRANCHES IN PRINCIPAL CITIES

Manufacturers of "SCOTCH" Brand Tapes... 3-M Abrasives... 3-M Floor
Waxes & Sealers... 3-M Adhesives... "SCOTCH" Reflective Material
... 3-M Cutting & Finishing Compounds... 3-M Lapping & Grinding
Compounds... Colorquartz Bonding Compounds... Spherulite Tympen Cover.

Minnesota Mining & Manufacturing Company

900 Fauquier Avenue, Saint Paul 6, Minnesota

☐ I'd like a copy of your book on the 3-M Method of Grinding & Finishing.

Name.....

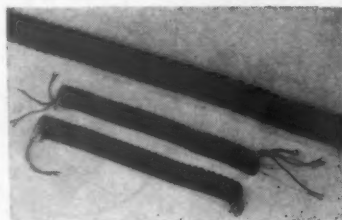
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(Continued from page 122)

RETRACTABLE ELECTRICAL CORDS



RETRACTABLE electrical cords are announced by Cordage, Inc., 6650 So. Cicero Ave., Chicago, Ill., division of Kellogg Switchboard & Supply Co. The manufacturing process involves spirally molding the rubber jacket, assuring retention of the cord's normal position. Maximum retractability is acquired without the use of wire springs or similar, separate mechanical devices. Neoprene and Buna-S have been used in place of rubber for the outside covering of Kellogg Coiled Kords with satisfactory results. Cords can be stretched to approximately seven times their original length.

COATED ALUMINUM- BRONZE ELECTRODE

NEW coated aluminum-bronze electrode, Airco No. 100, is announced by Air Reduction Sales Co., 60 E.

42nd St., New York, N. Y. This new coated high tensile bronze electrode is a shielded arc electrode and can also be used as filler rod in carbon arc welding. It will produce welding deposits of great strength and hot ductility, combined with desirable resistance to corrosion. Deposits are said to be superior to standard manganese bronze with respect to corrosion resistance, and equal to it in strength, hardness and ductility. Electrode has universal application, and can also be used for welding dissimilar metals.

HAMMOND AUTO-DOPER



NEW automatic air operated cylindrical and rectangular composition applicator for use on any type of polishing and buffing machine, is just announced by Hammond Machinery Builders, Inc.,

Kalamazoo, Mich. It is known as the Auto-Doper. It can be used for either cylindrical or rectangular bars, it is claimed, by merely changing the composition housing for the type of bar required. Frequency of operation is controlled by an air valve operated from a cam, electrical time or foot valve. Claim is made of more uniform application of composition, and economy in composition costs. Bulletin and full details on request.

(Continued on page 126)

NOW you can **GET** *these McKay Welding Electrodes*

These Commercial Grades of Stainless and Mild Steel Welding Electrodes are now available.

McKAY STAINLESS STEEL ELECTRODES

(All Diameters .075" to 1/4")

- 18-8, Type 308
- 18-8 Cb., Type 347
- 18-8 Mo., Type 317
- 25-12, Type 309
- 15-35, Type 330
- 15-60
- 25-12, Type 309
- 25-20, Low Carbon-Heat Resistant

STRAIGHT CHROMIUM

- 4-6 Cr., Type 502
- 12 Cr., Type 410
- 16 Cr., Type 430
- 18 Cr., Type 442
- 28 Cr., Type 446
- TOOL AND DIE

McKAY MILD STEEL ELECTRODES

(All Diameters 3/32" to 1/16")

- No. 16—A.W.S., E-6020 & E-6030
- No. 15—A.W.S., E-6010
- No. 17—A.W.S., E-6012
- No. 116—A.W.S., E-6012 & E-6013
- No. 3—A.W.S., E-4520
in straightened and cut lengths
or coil form for automatics
- No. 19—Cast Iron

*We can now give good service on orders for small sizes such as—.075" and 3/32", formerly so hard to get, because of recent increases in our capacity for producing the smaller diameters.

An easing supply situation now makes McKay Stainless and Mild Steel Electrodes available for commercial purposes. A list of these two grades for nearly every type of arc welding, appears at the right.

If you have been having trouble obtaining the Electrodes you require, here is an opportunity to get these grades from The McKay "researched line." Inventories are being gradually built up which should permit a more consistent supply of most of these analyses both now and in the future.

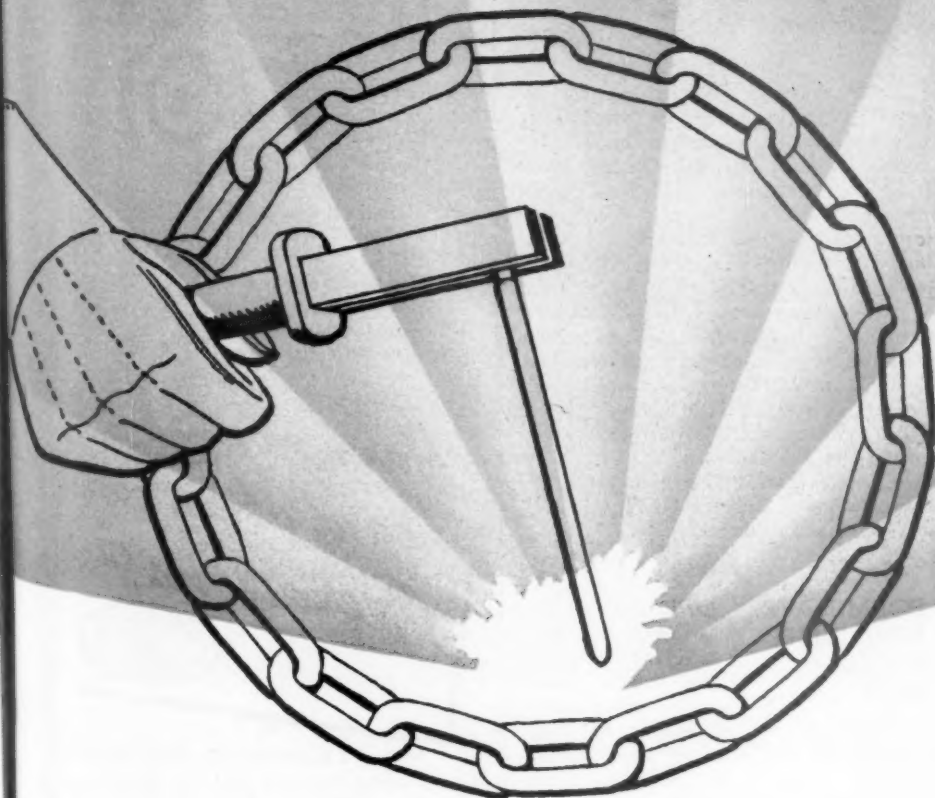
Your inquiry or order will receive prompt attention.

General Sales Office: York, Pa.

THE MCKAY COMPANY

PITTSBURGH, PA.

WELDING ELECTRODES . . . COMMERCIAL CHAINS . . . TIRE CHAINS





*You can depend
on Quality
with* **CORBIN**

Greater accuracy is a *Plus* for industrial buyers of screws and nuts . . . and a Corbin habit, because we are geared to work in tenths . . . but *fast*. That's why even our Standard Machine Screws pass every test for flawless uniformity.

Look to CORBIN

for your requirements in Screws and Nuts . . . a full range in both CORBIN-PHILLIPS and Regular Slotted. Also AIRCRAFT Screws and Nuts to Governmental specifications.

See your Distributor

— also complete stocks at Chicago, New York and New Britain . . . and sales representatives who can "talk shop." Write for Catalog.

SN-1A

THE CORBIN SCREW CORPORATION
The American Hardware Corporation, Successor
NEW BRITAIN, CONNECTICUT

Warehouses:
New York • Chicago



(Continued from page 124)

THYRATON WELDING CONTROL



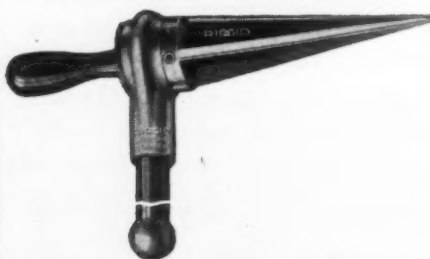
NEW thyatron welding control for providing precise control of low-capacity spot welders, is announced by the Industrial Control Division, General Electric Co., Schenectady, N. Y. Coupled with a suitable welding transformer, the control can be used with either welding tongs or a small bench welder, and is particularly suitable for the spot welding of vacuum tube parts. Other applications for which the control, in combination with the proper welding transformer, is desirable include the welding of solid or stranded wires to terminals of copper, brass, bronze, steel or ferrous alloys; joining two tinned-copper, steel, or alloy wires; and, spot-welding thin pieces of various alloys. Bulletin GEA 4175 describes control in detail.

FORMULATE NEW THREE- IN-ONE GLUE

developed by I. F. Laucks, Inc., Seattle, Wash. It is known as Lauxite hot press Urea Resin-8-9XC-U. It can be used straight; it can be used with a fortifier to meet standard three-hour boil test; and, with wheat flour of any gluten strength. It can be used with any wheat flour regardless of gluten strength and still obtain a free spreading, uniform viscosity glue.

ONE glue that can be used in three different ways, cutting costs, inventory and production time, has been

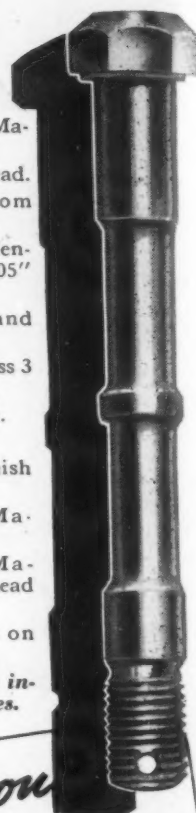
LONG-TAPER PIPE REAMER



NEW pipe reamer of extra long taper design is announced by the Ridge Tool Co., Elyria, Ohio. As a result of the long taper, the new reamer is claimed not only to avoid flaring, splitting or reducing wall of pipe, but to cut burr cleanly and easily from the inside of pipe or conduit. It is furnished with ratchet handle, or can be used with the ratchet handle of Rigid No. 00R ratchet threader.

(Continued on page 128)

1. Automatic Screw Machine — *inspection*.
2. Disc grind hex head.
3. Break hex bottom corners.
4. Form grind in Centerless Grinder to .0005" — *inspection*.
5. Undercut on Hand Screw Machine.
6. Roll thread to Class 3 limits — *inspection*.
7. Jig drill cross hole.
8. Countersink.
9. Disc Sander: finish top of head.
10. Hand Screw Machine: rethread.
11. Hand Screw Machine: finish-form head chamfer.
12. Break corners on chamfer.
13. *Final complete inspection with gauges.*



*Have you
heard about our
Operations?* **CORBIN**

This simple part *could* have been turned out in three or four basic operations. *But we performed no less than thirteen with four precision inspections . . . to make this bolt a better aircraft engine part.*

This efficient route requires a vast amount of equipment and experience. Corbin has both — ready to supply your precision parts exactly — *and economically.*

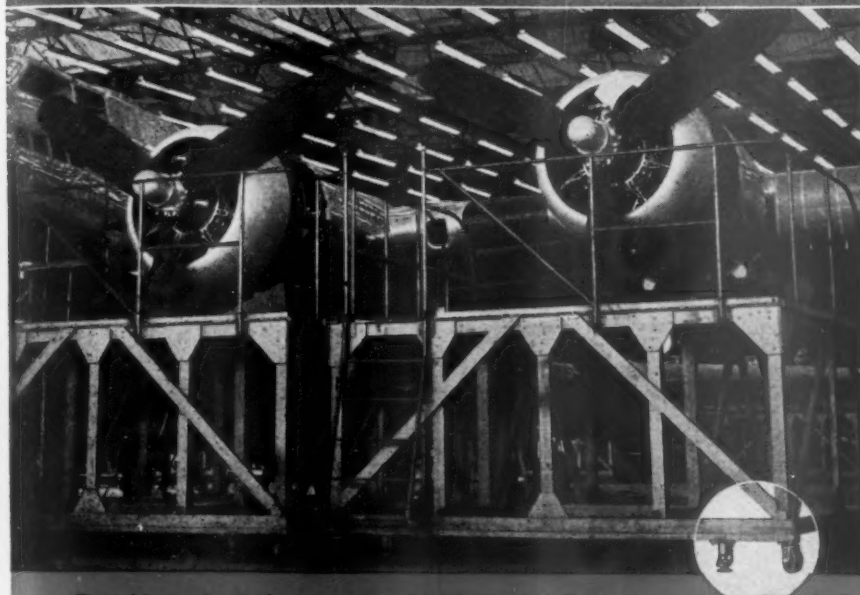
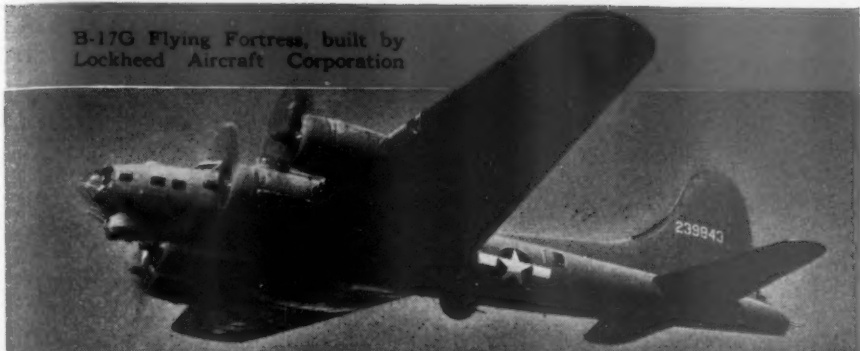
Some of our facilities may be available now. Send us your blueprints and specifications for prompt, helpful study of your precision requirements.

THE CORBIN SCREW CORPORATION
The American Hardware Corporation, Successor
NEW BRITAIN, CONNECTICUT

P-1A



B-17G Flying Fortress, built by
Lockheed Aircraft Corporation



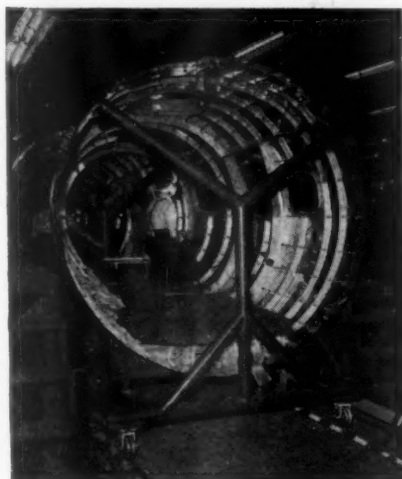
Portable work platforms equipped with Bassick Casters and Truck Locks aid in speeding and easing of work along the B-17G final assembly line.

Bassick Casters help *Lockheed* break B-17G Production Records

Production-wise engineers at Lockheed Aircraft Corporation made every second count in quadrupling since January 1943, the monthly production of B-17G Flying Fortresses.

That's why they took full advantage of the time-saving features of Bassick Casters, Truck Locks, and Bassick "Caster-eased" Production Lines.

Making casters capable of doing more of your conveying and materials-handling is Bassick's business — the largest of its kind in the world.

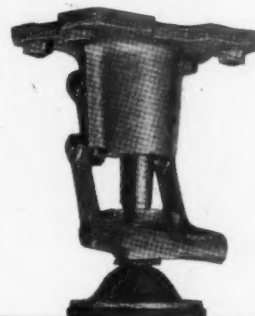


Grooved Wheel Casters Speed Production

Nose sections of Lockheed-built B-17G's with carriers mounted on Bassick Heavy-Duty Grooved-Wheel Casters on angle floor tracks.

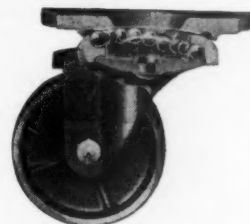
This important new method of handling gives compactness, flexibility and speed to production lines.

Flexibility and economy of handling, which good casters provide, along with a saving in man hours, play an important part in speeding vital production.



Floor Truck Lock

A simple, easily operated device for holding portable equipment securely in place.



Medium-Duty Swivel Casters

The famous Bassick series "77" is the largest selling type of quality caster. Sizes 3" to 8". All-purpose casters with the patented Bassick two-level ball race construction.

Bassick

MAKING MORE KINDS OF CASTERS
... MAKING CASTERS DO MORE

THE BASSICK COMPANY
BRIDGEPORT 2, CONN.

Division of Stewart-Warner Corp., Chicago, Ill.
Canadian Factory: Stewart-Warner-Alumite
Corporation of Canada, Ltd., Belleville, Ont.

Blades CROSS-ROLLED

SO Edges WON'T SPLIT

Why not get this Extra Value in Shovels without Extra Cost

If you want to be sure the Shovels you order have Blades made from TEM-CROSS Tillage Steel, be sure to specify . . .

INGERSOLL Shovels

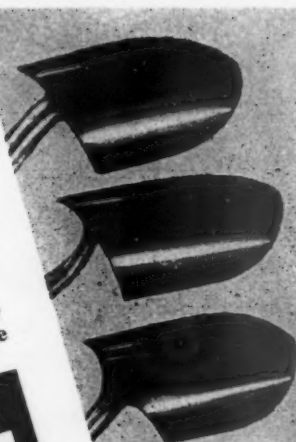
—on all your orders. Compare performance on the toughest jobs and note the extra service you get from these Shovels with "Blades that are guaranteed Split-Proof."

Distributors: Apply on Form WPB 547 with the Hardware and Small Tools Section of the War Production Board, Washington, D. C., for the necessary Priority Ratings.

INGERSOLL STEEL & DISC DIVISION
BORG-WARNER CORPORATION
NEW CASTLE, INDIANA
NEW CASTLE, Ind.; Chicago, Ill.; Kalamazoo, Mich.



All Blade Finishes now Black except Molders' Shovels and Grain Scoops which may be furnished with Polished Face and Brushed Back.



"A Borg-Warner Product"

Built to take it

Fairbanks Hand Trucks in war-time service are living up to their peace-time record for endurance and ease of operation.

They are proving their ability to take all kinds of punishment.

Write for
Catalog No. 51.

THE FAIRBANKS COMPANY

393 Lafayette St.,

New York 3, N. Y.

Boston, Mass.

Pittsburgh, Pa.



Fairbanks



"Aero-Seal" HOSE CLAMPS

Distinctive worm gear tightening action provides powerful belt-like pull-up. Uniform pressure all around prevents leaks. Can be put on or taken off hose in place on pipe. Can be re-used. No loose parts. Compact design. Extremely long take-up. Made in sizes from 1/2" up. Write for circular.



Proved outstandingly reliable in severe service on aircraft fuel, oil, and coolant lines.

Aircraft Standard Parts Co.

1755D NINETEENTH AVE., ROCKFORD, ILL.



(Continued from page 126)

SHELLAC SUBSTITUTE PATTERN COATING

Inc., Buffalo, N. Y. It is a spirit varnish having all the characteristics of shellac; brushes easily, dries quickly, can be sandpapered smooth or recoated shortly after application. Comes in clear and three colors—yellow, red and black. The clear is similar in appearance to orange shellac. These "brush on like an enamel."

HARDLAC is the name of protective coating for wooden foundry patterns developed by McDougall-Butler Co.,

TAG EMBOSSING MACHINE



QUICK-SET tag-embossing machine is announced by Jas. H. Matthews & Co., Pittsburgh, Pa. Machine is designed to meet the need for frequent changes in set-up, and will accommodate either coiled

sheet metal strips, which are cut into tags of any desired size or tags already cut to size. Manufactured to order, the machine can be supplied to emboss as many as 16 characters at one time from 3/16" to 1/2" in size. Maximum tag thickness recommended is 24 gauge, though heavier materials can be embossed. Machine will emboss one line of characters only.

SPONGE CLIPPINGS WITH CHAMOIS

oped, which is said to be an ideal protection padding. It incorporates the use of sponge clippings and chamois skins. The chamois skins do not dry hard after being exposed to perspiration. Sweat band is said to eliminate hazard of sweat getting into workmen's eyes. James H. Rhodes & Co., 157 W. Hubbard St., Chicago 10, Ill.

AN entirely new type of lining for goggles, chin straps, sweat bands and other headgear has been developed,


NEW THREAD DESIGN



NEW thread design based on the American National thread, with the Dardelet thread principle incorporated, is presented by the Dardelet Threadlock Corp., Detroit 11, Mich. Design is said to reduce lateral motion and resulting fretting between mating parts; overcome galling during stud assembly; seal against leakage through the thread fastening; increase resistance to fatigue, and increase strength in stud in tension and torsion. Can be driven into an A.N. tapped hole after reaming. Detail descriptive matter available on request.

(Continued on page 130)

A NEW METHOD OF PACKAGING . . BY PIONEERS IN PROTECTIVE COATINGS

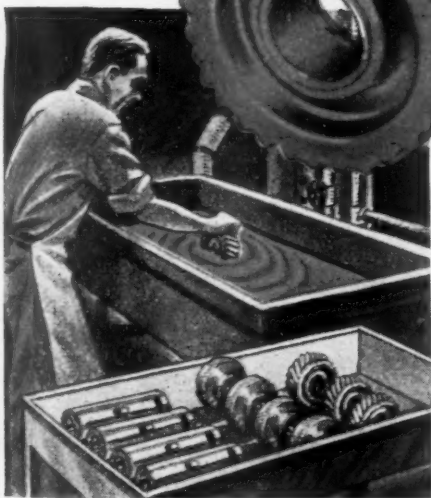


Ethylseal

FOR THE PROTECTION OF
METAL PARTS



From Dip Tank to Battle Front:



Metal parts are dipped in hot melt *Ethylseal* which forms a strong, durable, moisture-resistant coating, having no adhesion to the part. Protection in every climate is provided by the *Ethylseal* coating, and packaging costs are substantially cut. Parts are made ready for service by simply stripping off the coating.

POST WAR USES *Ethylseal*, in peace time, will have many applications for the protection of parts for automobiles, agricultural implements, business machines and hardware items. Why not start now to investigate the possibilities of *Ethylseal* packaging for your post war products?

PONTIAC VARNISH COMPANY

PONTIAC MICHIGAN

Manufacturers of Paint Finishes for Industry





How to Save time and money on your post-war retooling!

DELTA MILWAUKEE

BLUE BOOK FOR MANAGEMENT, SHOP & PRODUCTION ENGINEERS

140 Examples from War Production — in Delta's New 76-page BLUE BOOK

Ingenious combinations of low-cost stock-model Delta tools — devised by production men in America's leading war plants — have written a new chapter in modern tooling practice. • Special-purpose machines, increasing production 200% to 600%, have been built at a fraction of the cost and in a fraction of the time ordinarily involved. This minimum capital investment, moreover, is flexible — being composed chiefly of standard

elements which are readily convertible. • This new free book pictures and describes a wide range of applications — actual, detailed case histories which give your production men a running start on your own special problems in working metals, wood, or plastics. Break your war-production bottlenecks — plan for an edge in post-war competition — with these modern methods. Write for free copy of the Blue Book.

MA-6

Tear out and mail

this coupon today

DELTA MILWAUKEE Machine Tools

THE DELTA MANUFACTURING CO.
713D E. Vienna Ave., Milwaukee 1, Wisconsin

Please send my free copy of your new 76-page Blue Book, and catalog of low-cost Delta tools.

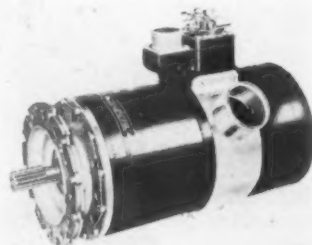
Name.....Position.....

Company.....

Address.....

City.....(.....) State.....

(Continued from page 128) NEW AC-DC POWER SUPPLY SYSTEM



NEW Eclipse AC-DC power supply system consisting of engine driven AC-DC generators and carbon pile voltage regulators, for both the AC and DC outputs, is announced by Eclipse-Pioneer Division, Bendix Aviation Corp., Teterboro, N. J. System provides a dependable source of alternating current for operation of various radio devices and direct current for operation of DC electrical equipment. Generators are designed to mount on main engine generator drive pads of aircraft, now in production or undergoing design, incorporating provisions for generator blast cooling. Unit illustrated provides 200 amperes at 28.5 volts DC and 10.4 amperes at 115 volts AC at speeds from 4400 to 8000 RPM.

SYNTHETIC RUBBER INDUSTRIAL GLOVES

TWO styles of industrial gloves made from synthetic rubber are now being manufactured by the B. F. Good-

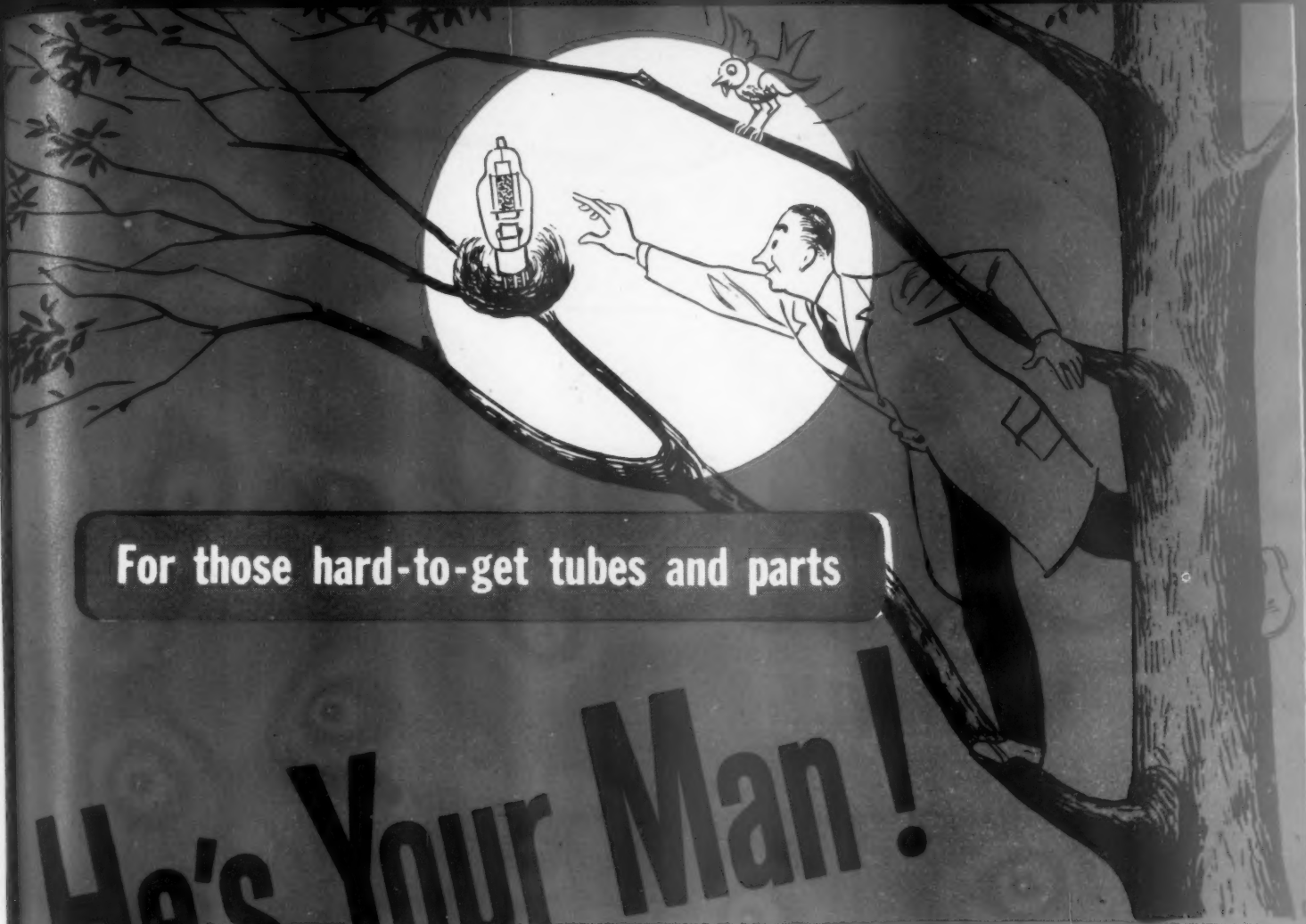
rich Co., Akron, Ohio. One of the gloves is a lightweight type of .15 inch gauge, 10½" length; sizes in halves, range from 7 to 11. The other is of .30 inch gauge, 14 inches in length, sizes 10, 10½ and 11. Heavier glove is available only in straight finger style. Company says gloves are equal in most respects to those made from natural rubber. They are as good as natural rubber gloves in resistance to acids, and as grease and oil resistant.

PORTABLE HEATING TANKS



ILLUSTRATION shows Model 20 heating tank being built by the Youngstown Miller Co., Sandusky, O., which is portable. It consists of a well insulated heating tank equipped with electric heaters—a motor and pump for circulating the oil—thermostats for maintaining the oil temperature within certain limits—complete with electric controls, valves all mounted on casters.

(Continued on page 134)



For those hard-to-get tubes and parts

He's Your Man!

HE is your round-the-corner RCA Tube and Equipment Distributor. He is your *personal* Emergency Electronic Expediter. Too often you think of him as a last resort, when every other source fails you. Give him a break —yourself too—by calling him in first, when trouble starts.

He spends his days—often his nights, too—helping you war-gearred manufacturers to locate hard-to-get electron tubes and components so you can fill rush priority orders. He has to, to stay in business today.

You'll find him ready and eager to help... with these 4 war-time services:

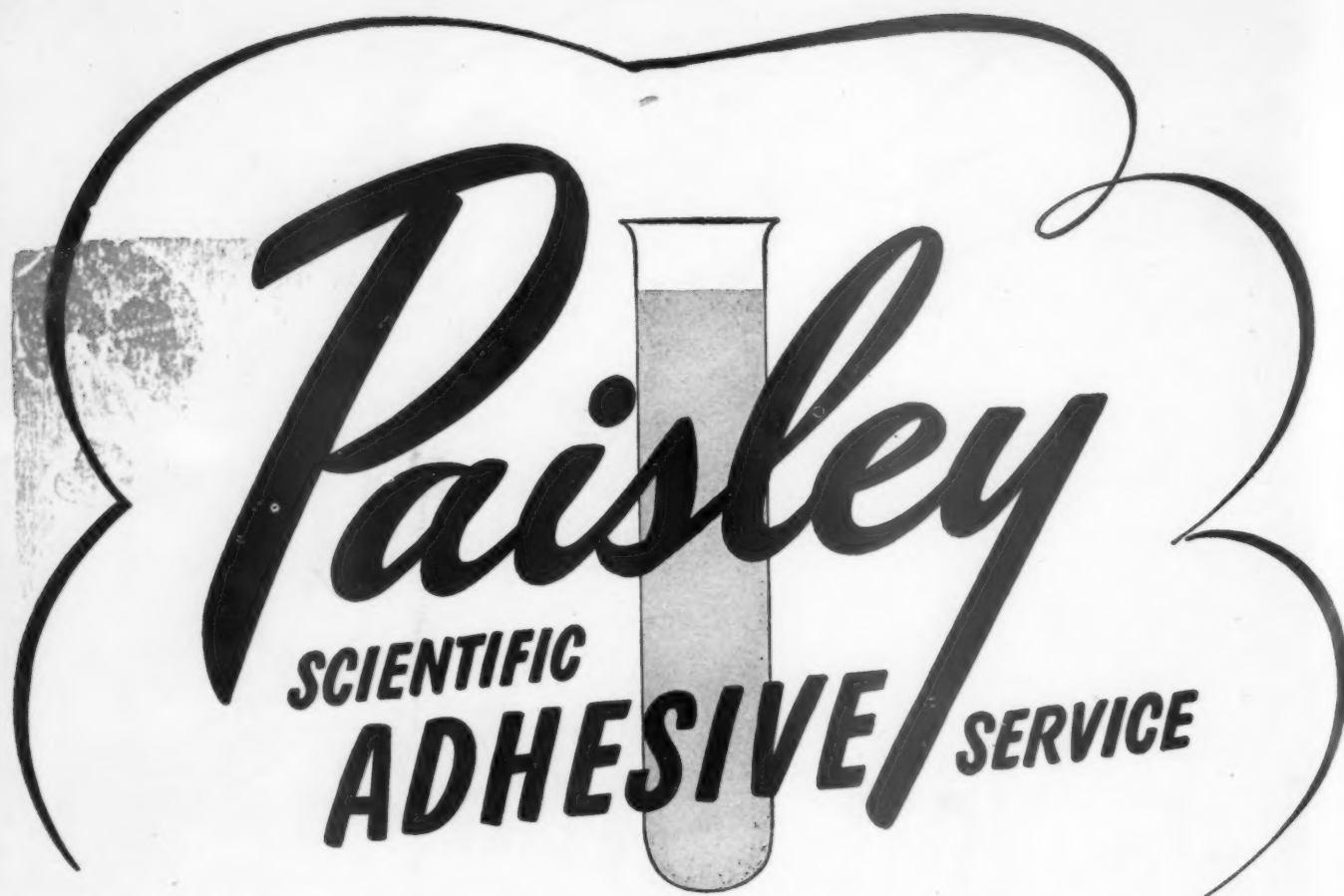
- 1—Local supplies
- 2—Technical "know how"
- 3—Quick delivery
- 4—Intelligent emergency expediting

There are more than 300 of "him" located at strategic points throughout the United States.

If you don't already know one located near you, write or wire us and we'll give you his name...on the double! RCA VICTOR DIVISION, Camden, New Jersey.



**RADIO CORPORATION
OF AMERICA**



THERE'S a laboratory-developed, tested and controlled PAISLEY Scientific Adhesive for practically every fabricating, manufacturing, product labeling and sealing operation. New proven formulae are ready to fulfill all government and civilian specifications. Paisley Scientific Adhesives are **GUARANTEED** to do the job satisfactorily or invoice cancelled! Buy adhesives the scientific way. Send for an Adhesive Problem Data Sheet. Fill in and return it to our laboratory for analysis and recommendation. Get the **ONE** best guaranteed adhesive for the **SPECIFIC** operation. Write today! There's no obligation.

IT'S EASY for you to give us the exact information we need with the aid of this "Adhesive Problem Data Sheet". Properly informed, our skilled adhesive chemists can recommend or develop a formula guaranteed to perform the specific operation successfully. Don't take chances with ordinary adhesive service. Send for a data sheet now!

PAISLEY PRODUCTS INCORPORATED

Manufacturers of Glues, Pastes, Resin Adhesives, Cements, and Related Chemical Products

1770 CANALPORT AVE., CHICAGO 16, ILL. ★ 630 W. 51st STREET, NEW YORK 19, N. Y.



MAYBE it would surprise you to see what the girls can accomplish these days! And with little or no help from the stronger sex!

Figure the time, for example, it would take three husky men to move a pile of castings from here to there *without* a Barrett Lift-truck! And don't overlook the piling and repiling!

Yet, the entire load can be moved as a *unit* with a Barrett—and with surprisingly little effort. Even the heaviest loads are

moved swiftly, safely and efficiently with a Barrett Lift-truck on the job.

If you still question the ability of women to pinch-hit for the boys at the front—to "man-handle" these heavy loads with ease, we suggest you call in a Barrett engineer. He has some interesting—and pleasing—facts for you.



Your copy of the Barrett Junior Catalog will be sent on request.

BARRETT-CRAVENS COMPANY

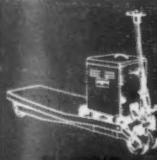
3280 West 30th Street • Chicago 23, Illinois

Representatives in All Principal Cities



BARRETT

ONE MAN DOES MORE THAN 3 OR 4 ... WITH A BARRETT LIFT-TRUCK



ELECTRIC LIFT-TRUCKS

**Barrett
Handling
Equipment**



HAND LIFT-TRUCKS



SKIDS



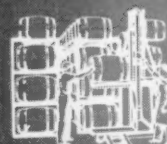
BARREL TRUCKS



NIFTY SYSTEMS



PORTABLE ELEVATORS



STEEL STORAGE RACKS



**Vital Links in
modern Production**

**ALLIED MACHINE &
ENGINEERING CORP.**
NEW PHILADELPHIA, OHIO

PLYWOOD

**Pacific Mutual
Door Co.**



National Distributors

DOUGLAS FIR PLYWOOD

Since 1921

Mills: OREGON, WASHINGTON
Home Office: TACOMA 1, WASH.

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CHICAGO 8, ILL. ST. PAUL 4, MINN. KANSAS CITY 3, KAN.
GARWOOD, N. J. BALTIMORE 31, MD. LOS ANGELES 21, CAL.

WRITE US FOR PRICE LIST AND GRADE USE GUIDE

(Continued from page 130)

PORTABLE LIFTING TABLE



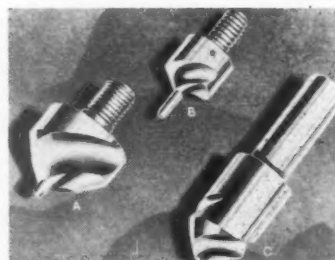
NEW, flat top portable lifting table for speeding up the handling of dies, is announced by the Barrett-Cravens Co., 3250 W. 30th St., Chicago, Ill. With a simple crank-up mechanism, the flat top table is adjustable to heights ranging from 24" to 40", enabling operators to quickly and easily handle dies of all sizes and shapes. Tables can also be used to support and level long bars, sheets, frames, etc., for fabrication on horizontal mills. Style F-1 has table size of 28 x 40"; style F-2 has table size of 24 x 32"; maximum loads 3,000 lbs. and 2,000 lbs., respectively.

HEATING COOLING PROGRAM CONTROLS

NEW line of instruments named Chronotrols for enforcing any desired heating or cooling program has been

announced by Wheelco Instruments Co., Chicago 7, Ill. Instruments are built around the company's established line all of which employ electronic principle of temperature control. Chronotrols are offered in 25 models, including 10 for proportioning control and others for two-position on-off and three-position on-intermediate-off control for high and low temperature applications. Absence of mechanical linkage between the measuring and control sections make possible instant response of the instrument's control unit to changes in temperature noted by its sensing unit.

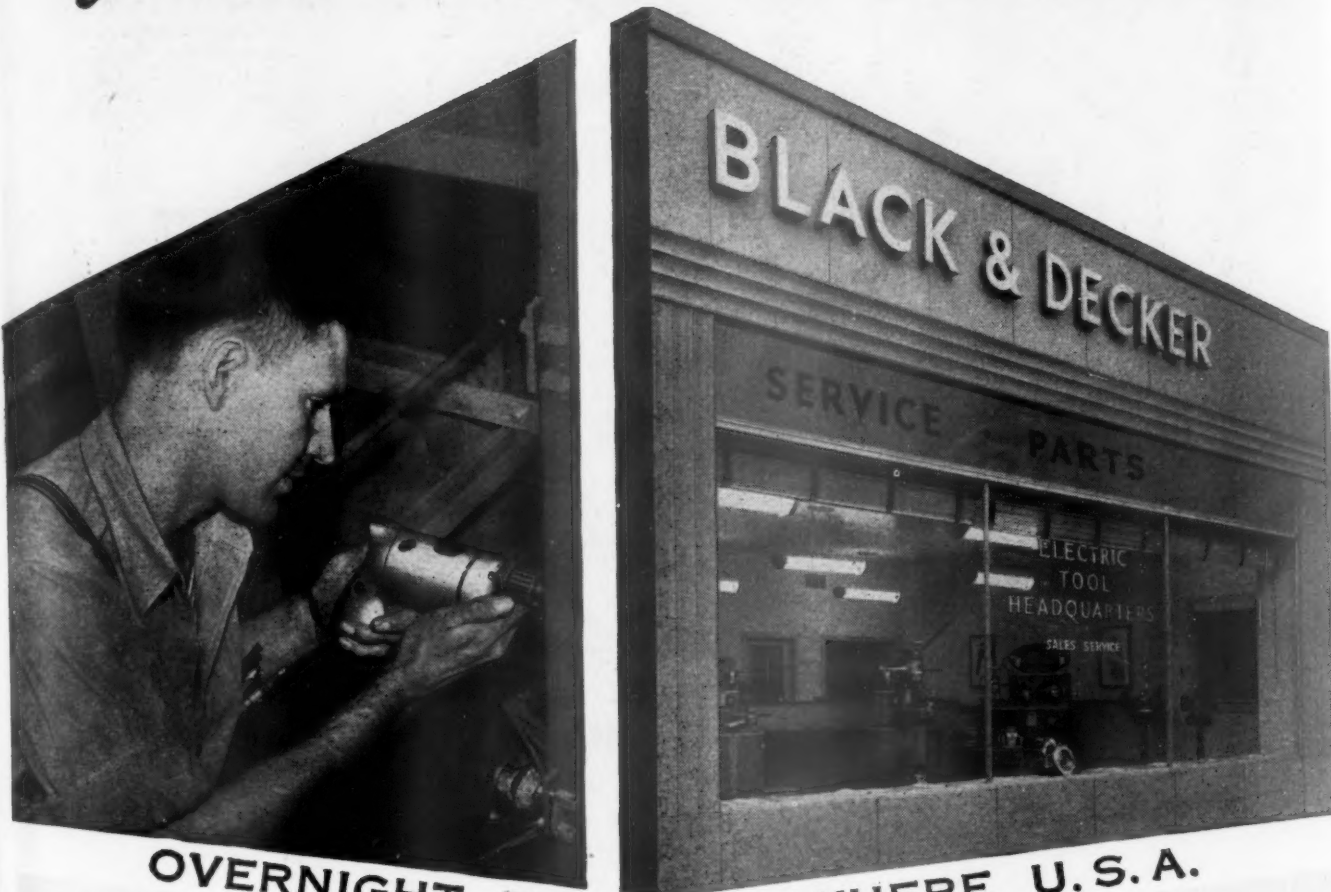
COUNTERSINK CUTTERS



LINE of precision countersinking cutters for use on all types of countersinking machines and devices, is announced by the Farnham Mfg. Co., 1638 Seneca St., Buffalo, N. Y. They are made in a wide range of sizes and rivet angles to fit all production requirements. Rivet angles are made for all standard rivets and screws. They are also made in the built-in pilot style. Interchangeable pilots in cutters permit their use for several sizes of holes.

(Continued on page 138)

"Just Around the Corner" in 25 Cities*



OVERNIGHT FROM ANYWHERE U.S.A.

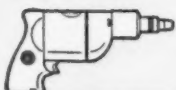
Repair and Parts Service on Black & Decker Tools



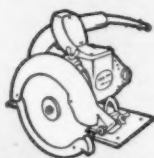
ELECTRIC DRILLS
AND TAPPERS



PORTABLE SANDERS
AND GRINDERS



SCREWDRIVERS
AND NUT RUNNERS



ELECTRIC SAWS AND
SHEET METAL SHEARS

HERE'S another reason why American Industry uses more Black & Decker Portable Electric Tools than any other make: Only Black & Decker offers "Factory Service" so close at hand. In 25 major cities are Company-owned Branches, fully stocked with Black & Decker replacement parts, where factory-trained men give fast, expert repair service on Black & Decker Tools. And, wherever you are in the U. S. A., a Black & Decker Factory Branch is no more than overnight from your plant. Black & Decker Tools are saving time today throughout war industry—drilling and tapping . . . driving screws and running nuts . . . sanding and grinding . . . sawing wood and cutting sheet metal—on continuous production schedules.

Speed your production for war—and simplify the changeover to peacetime manufacture later—by standardizing on Black & Decker Tools. There's a distributor near you—a ready source of information and supply on the complete Black & Decker line. The Black & Decker Mfg. Co., 764 Pennsylvania Ave., Towson-4, Maryland.

• • •

★ FACTORY BRANCHES—Atlanta, Ga.; Baltimore, Md.; Boston, Mass.; Buffalo, N. Y.; Chicago, Ill.; Cleveland, Ohio; Dallas, Texas; Denver, Colo.; Detroit, Mich.; Indianapolis, Ind.; Kansas City, Mo.; Los Angeles, Calif.; Memphis, Tenn.; Minneapolis, Minn.; Newark, N. J.; New Orleans, La.; New York, N. Y.; Philadelphia, Pa.; Pittsburgh, Pa.; San Francisco, Calif.; Seattle, Wash.; St. Louis, Mo.; Towson, Md.; Toronto, Ont.; Montreal, Que.

LEADING DISTRIBUTORS  EVERYWHERE SELL

Black & Decker

PORTABLE ELECTRIC TOOLS

PROTECTION →
DEPENDABILITY →
SERVICE →

Certified FLEUR-O-LIER

The Manufacturer guarantees by affixing this label that this Fluorescent Luminaire is a duplicate of samples found by periodic examination to comply with the minimum requirements as set up in the

"SPECIFICATIONS FOR LUMINAIRES, FITTINGS AND AUXILIARIES FOR FLUORESCENT LAMPS"

which are sponsored by the Manufacturers of Mazda Lamps.

Electrical Testing Laboratories, Inc.
NEW YORK, N. Y. 4-42



A COPY OF THIS CERTIFICATE SHOULD
APPEAR UPON EACH UNIT OR PACKAGE



FLUORESCENT LIGHTING FIXTURES EMPLOYING EXISTING
TYPES OF LAMPS ARE NOT RECOMMENDED FOR SCHOOLS, OFFICES AND
SIMILAR LOCATIONS UNLESS LAMPS ARE SHIELDED FROM DIRECT VIEW

THIS CERTIFICATION IS CONTINGENT UPON EMPLOYMENT
OF CERTIFIED AUXILIARIES OF OVER 85% POWER FACTOR

LOOK FOR THIS LABEL

Get all three with **FLEUR-O-LIER**

**Want to get the most from fluorescent?
Then remember these facts:**

Certified FLEUR-O-LIERS are fluorescent lighting fixtures made by many leading manufacturers; offer wide variety in sizes and designs.

They have been tested, checked and Certified by independent experts, Electrical Testing Laboratories, New York. They must meet 50 definite standards for electrical, mechanical and lighting excellence . . . including Certified Ballasts and Starters.

They are available in industrial and commercial types for war plants, offices, drafting rooms and other war essential locations. (Priorities A-1-j or higher.)

The quickest way to get the protection, dependability and service you need and want is to insist on fixtures wearing the famous Fleur-O-Lier label.

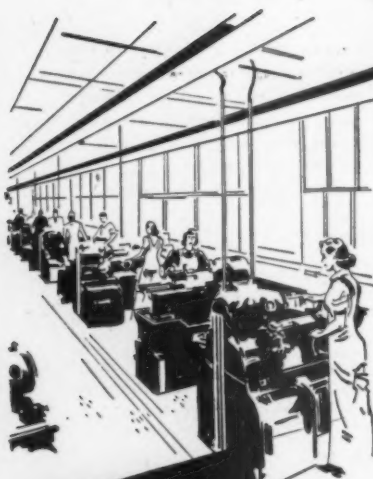
Of course, today's Fleur-O-Liers conform to WPB limitations in the use of critical materials.

FLEUR-O-LIER MANUFACTURERS • 2139-4 KEITH BUILDING • CLEVELAND 15, OHIO

FLEUR-O-LIER

CERTIFIED FIXTURES FOR FLUORESCENT LIGHTING

Participation in the FLEUR-O-LIER MANUFACTURERS' program is open to any manufacturer who complies with FLEUR-O-LIER requirements



• Fleur-O-Liers are equally desirable in the office, factory or store.



• For continuous row lighting as well as for individual units, it pays to specify Fleur-O-Liers.

Get this Book

NEW! Write today for new booklet containing complete FLEUR-O-LIER engineering specifications, together with the FLEUR-O-LIER story and list of manufacturers.





***Keep your extinguishers in shape . . . FREE BOOK tells how!**

WHEN fire breaks out, there's no time to repair or recharge extinguishers—they must be ready to hit the blaze fast! So the logical time to keep the equipment in fighting form is *before* the emergency . . . by systematic inspections at fixed intervals.

A method for setting up an extinguisher maintenance system in your organization is outlined in a booklet prepared by Walter Kidde & Company. It covers *all* types of equipment, tells exactly what to check on each type, how often to examine and recharge. It shows how extinguishers should be placed and marked, how records should be kept. This book "Inspection and Maintenance of First Aid Fire Extinguishers", will be sent you upon request. Write for your copy:



WALTER KIDDE & COMPANY, INC., 446 MAIN STREET, BELLEVILLE, N. J.



Guarantees Quality in Waterproof Work Clothing

★ The "Rainfair-Vulcanized" label is backed by over 60 years of specialized experience in the manufacture of waterproof work clothing. Insist on it as a guarantee of top quality and extra features in . . .

★ RAINCOATS ★ HATS ★ APRONS ★ SUITS
★ LEGGINGS ★ INDUSTRIAL SPECIALTIES

While military requirements have preference on Rainfair's production lines these days, garments are also available in limited quantities for essential civilian use. Write for condensed catalog of Rainfair products and name of nearest distributor.

LOOK FOR RAINFAIR QUALITY FEATURES

Gum strapping vulcanized on shoulder seams and arm holes for water-tightness, strength.

Rainfair-Vulcanized assures 100% water-proofness, unusual strength at seams, stubborn resistance to wear and deterioration.

Ample room throughout for freedom of action.



Reinforcing stays under fasteners give greater endurance.

Seams cemented, hand-rolled to make them 100% water-tight.

Rivets at points of strain provide extra strength for strenuous service.

RAINFAIR INC.

(Formerly Chicago Rubber Clothing Co.)

Dept. 34-D, RACINE, WISCONSIN

Also Manufacturers of Rainfair Storm Coats and Coated Fabrics for Industry.

(Continued from page 136)

COUNTING SMALL PARTS



DOUBLE ratio scale, Type 1133-C is offered by the Howe Scale Co., Rutland, Vt., which is said to be especially adapted for counting small parts, because of the unusually high sensitivity provided by a third pan attached to the lower beam lever. Described as fully automatic, this fan bench type scale is designed for the quick, accurate counting and weighing of materials in shipping, receiving and production departments, as well as for inventory and similar counts of small parts. No ratio charts, reference tables, or mental calculations are necessary.

ANNOUNCE NEW GRINDING COOLANT

MICRO GRIND
No. 132 is name of new grinding coolant announced by Quaker Chemical Products Corp.,

Conshohocken, Pa. Compound mixes with water to form a grinding fluid which is said to eliminate pick-up, grinding checks, glazing, burning and distortion on all grinding, honing and superfinishing operations. Other claims include superfine finishes free from glaze, elimination of 2 out of every 3 wheel dressing, faster cutting, and as much as 300% increase in wheel life.

PORTABLE DIPPING TANK



NEW type of portable heating and dipping tank, including an acid compartment, has been developed by Heil Engineering Co., 12901 Elmwood Ave., Cleveland, Ohio. The tank is divided into three compartments which are basically designed for degreasing, rinsing and pickling. It is also suited for etching, plating, metal coloring, waxing, fluxing, oiling, lacquering, dip painting, rust removing, macro and salt spray testing, and other uses. Tank has dual purpose cover and shelf which is thoroughly acid proofed and arranged to drain into the tank. Overall size of standard models is 20" x 56" x 36" high. Special sizes are available.

(Continued on page 140)

Built to last longer

.... EVEN TO THE OUTER BRAID

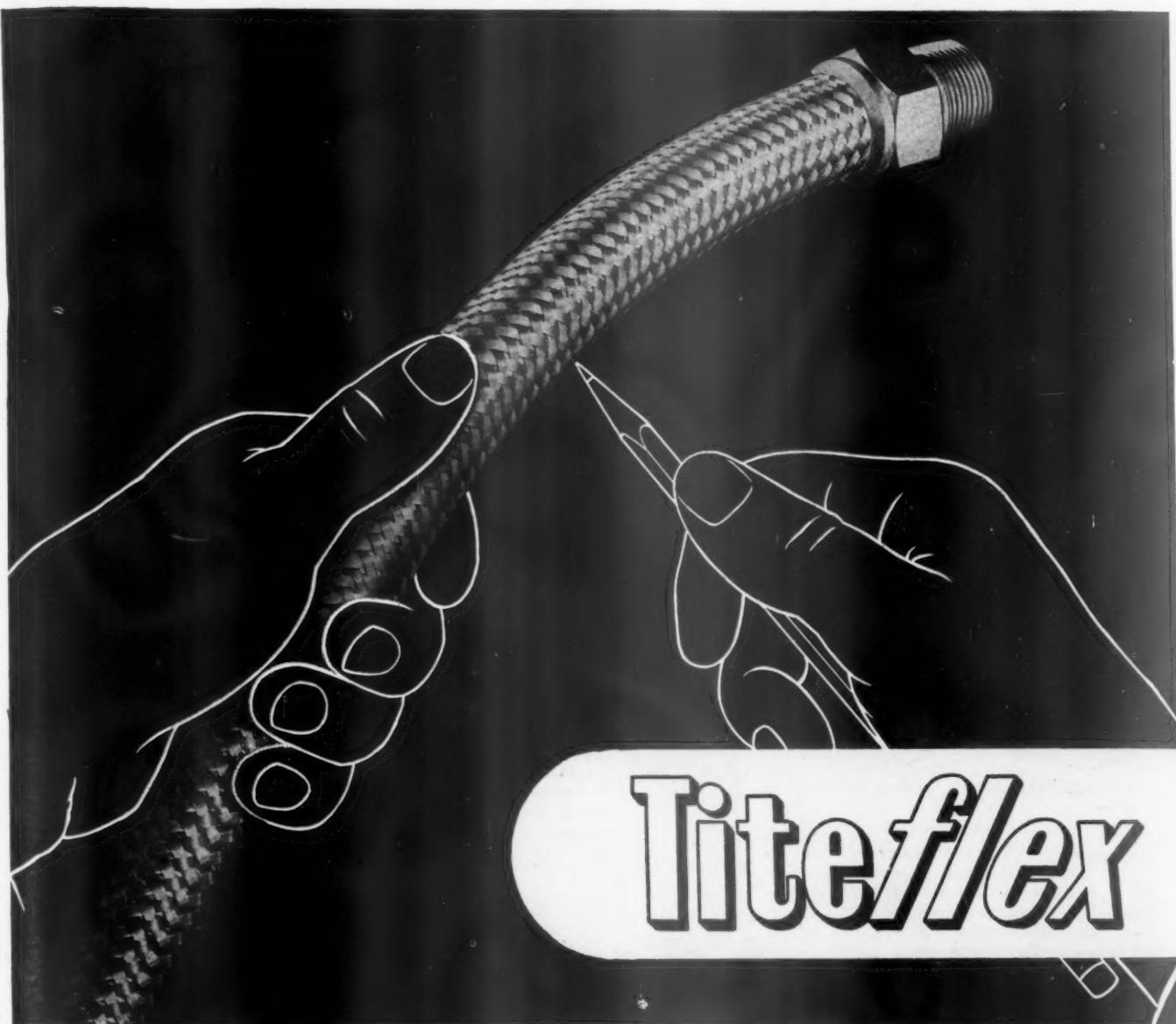
See that "braided" covering? It's unlike anything you'll find on usual types of tubing. For this is no jacket, simply slipped over the tubing after it is made. Instead, it's woven right *onto* Titeflex, and becomes an actual part of the tubing itself. Result: Titeflex lasts longer, takes more abuse, and won't elongate even under extreme pressure.

- Add to this the fact that Titeflex is *all metal* with nothing to deteriorate — and you'll

see why Titeflex is *the* flexible tubing for nearly every industrial use — whether it involves the handling of gas, oil, steam or acids — whether in your manufacturing process or in your manufactured product.

- Titeflex engineers are prepared to help you now with applications of Titeflex metal tubing for both your war and post war needs.

TITEFLEX, INC.
533 Frelinghuysen Avenue,
Newark 5, New Jersey





ON CLEANING FOR BUSY PURCHASING AGENTS

Bridging The Gap From . . .

. . . peace to war production was made easier for thousands of purchasing executives because they took advantage of Oakite Advisory Service. It helped them obtain!

- (1) the right Oakite material for facilitating many new cleaning, degreasing or descaling operations.
- (2) up-to-the-minute information on new wartime developments in cleaning materials and techniques.

So again . . . when the time comes to reconvert your plant facilities to the manufacture of products for post-war markets, be sure to

keep fully posted on the many NEW Oakite materials and methods that will soon be available.

NATION-WIDE SERVICE

Take advantage of Oakite Nation-Wide Field Service. Through it you can find practical solutions to your cleaning problems . . . new ideas for doing the work EASIER and FASTER, at less cost. Write today!

OAKITE PRODUCTS, INC.
54 Thames St., NEW YORK 6, N. Y.
Technical Service Representatives Located in All
Principal Cities of the United States and Canada

OAKITE
Specialized
CLEANING
MATERIALS . . . METHODS
SERVICE

Buy Bonds for Victory!

IRON HORSE
BRAND
OILY WASTE CANS
Protect Your Plant
From Fire



No. 18HO

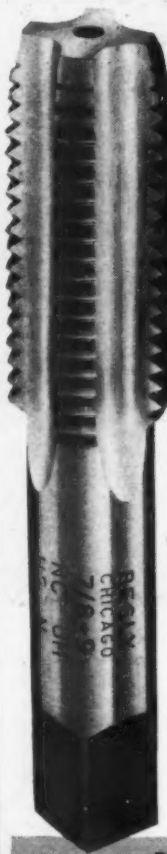


No. 18FL

14 Gallon Capacity

Decrease fire hazards wherever oily waste and inflammable material is used. With or without foot lever. Approved by Underwriters' Laboratories, Inc. and Associated Factory Mutual Fire Insurance Companies.

ROCHESTER CAN COMPANY
90 GREENLEAF ST. ROCHESTER, N. Y.



3 Reasons To Make BESLY TAPS your choice

1. The high quality of Besly Taps is guaranteed by uniform specifications for material, skilled manufacture, rigid inspection.
2. Besly has more than 53 years experience in manufacturing standard and special taps at their Beloit, Wis. factory.
3. Besly Taps are stocked and sold through distributors, added selectively as sufficient production makes it certain they can render service in their areas.

Write for Besly's Tap Catalog and data book, or ask a field engineer to call.

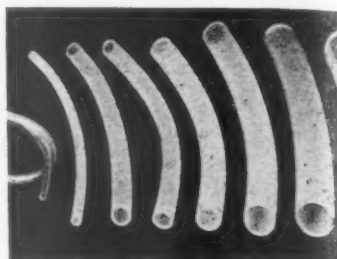


Besly Taps • Besly Grinders
and Accessories • Besly
Titan Abrasive Wheels

BESLY

Charles H. Besly and Company
118 N. Clinton St., Chicago 6, Ill. Factory: Beloit, Wis.

(Continued from page 138) SOLVENT-PROOF TUBING

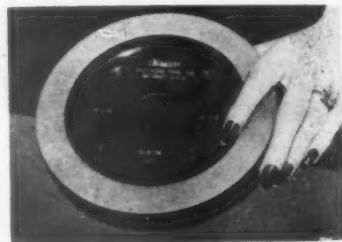


SOLVENT-proof, rubber-like and transparent tubing, made of compar, a special type of vinyl resin, has been developed by Resistoflex Corp., Belleville, N. J. Tubing is tough, strong, and completely inert to almost all organic solvents, and manufacturer states it is highly useful for low pressure, room temperature handling of such materials. It is not affected by carbon disulphide, carbon tetrachloride, trichlorethylene, perchlorethylene, acetylene tetrachloride, benzol and toluol, or by oils and fuels, such as high octane gasoline with the highest aromatic content. It is not generally recommended for industrial applications which now employ fabric reinforced hose constructions containing tubes or cores of other formulations.

NEW COM- PRESSED AIR LINE FILTERS

SIX outlets in manifold and new self dumping trap which automatically empties the water are features of new compressed air line filters announced by Filters, Inc., Box 471, Glendale, Calif. Outlets are $\frac{3}{8}$ " to accommodate snap-on hose connections. Float guarantees positive opening and closing of discharge valves. According to manufacturer, the filter prevents, dust, rust, scale, oil and water from entering air tools.

ABRASIVE DIAMOND TOOLS



LINE of abrasive diamond wheels in popular sizes and most widely used types, is announced by The Abrasive Dressing Tool Co., Detroit, Mich. In addition to straight, pointed and rounded types with diamonds in the periphery, there are also plain cup, flaring cup and dish-types with straight or beveled insides. Hand lapping hones with diamonds at either one or both ends are also available. Facilities are available for the production of diamond wheels in spherical shapes and sizes.

(Continued on page 142)

Dayton Rubber's Great New V-Belt Catalog



Never before have engineers been offered such a valuable and comprehensive encyclopedia of V-Belt information and data. Its use can save you countless hours of time. Here are a few of the highlights:—

★384 pages of complete drive information and data

in one handy pocket-size volume.

★Lists millions of drive combinations for quick, easy selection.

★Comprehensive V-to-V and V-Flat Drive data for planning rapid conversion of production.

★Lists for the first time in any V-Belt catalog, speed-up V-Belt Drives for standard motor speeds; speed-up and speed-reduction drives for engines, jack-

shafts, etc.—all without calculation or engineering.

★Complete engineering data with tables and graphs on V-Belt H. P. ratings and belt speeds.

★Tells how to design fixed-center drives, quarter-turn drives, etc.

★Perfectly indexed by sections and subjects to enable you to get all the facts instantly.

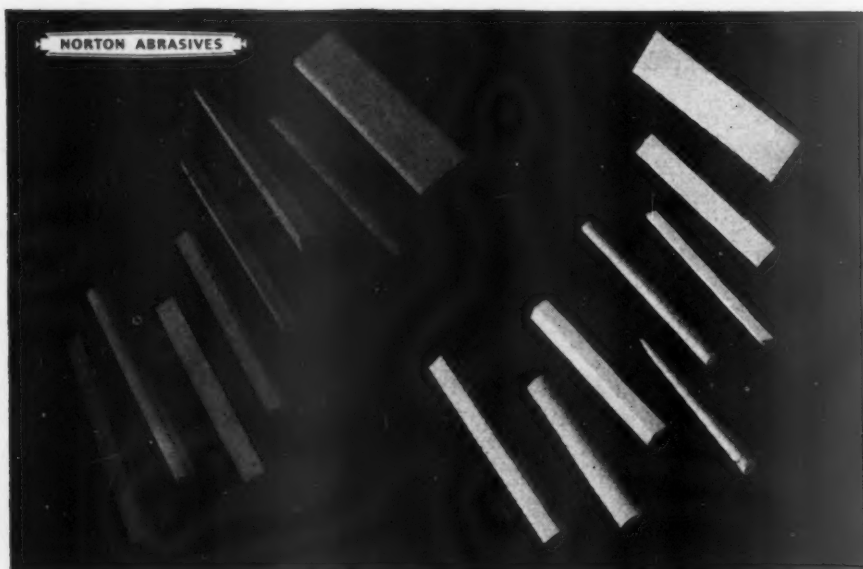
When you see this remarkable book we believe you will agree that its publication is further evidence of Dayton's leadership in the V-Belt field. If you have not received your copy, write for it today.

LET'S ALL
BACK THE ATTACK
WITH WAR BONDS

THE DAYTON RUBBER MANUFACTURING CO.
DAYTON 1, OHIO

One of the operators of the first Government Dual-Unit Type Synthetic Rubber Production Plants

V-Belts by Dayton Rubber



They Pay Big Dividends

For Hand-stoning Tools, India and Hard Arkansas Oilstone Shapes pay their way hundreds of times over through faster, better, more cuts from the bits, drills, reamers, and millers they sharpen.

The resulting increased output from the keener edges produced can easily run into hundreds—yes, thousands—of dollars from a tiny investment in some of these precision oilstones (say 75 cents for a rough average).

Whether all your cutters are sharpened at a central location under a trained tool engineer or touched up right at the machine, by all means *bring up the final edge by hand stoning.* It pays amazing dividends in metal and time saved.

And in Die Finishing, also, these oilstones are indispensable. The great choice in shapes and grits, from coarse India to the unmatched fineness of the Hard Arkansas Stones, makes it possible to impart any degree of finish desired to the most intricate and expensive dies.

Ask our Field Engineer or your friendly distributor's man about them.

Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit,
Grand Rapids, High Point, Indianapolis, Los Angeles,
New York, Philadelphia, St. Louis, San Francisco, Tacoma.



BEHR-MANNING · TROY, N. Y.

(DIVISION OF NORTON COMPANY)

ALSO RELIABLE COATED ABRASIVES SINCE 1872

(Continued from page 140)

TRACTOR TRUCK LIFT

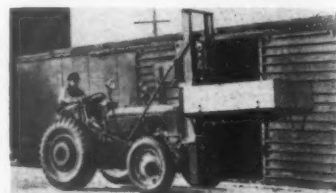


ILLUSTRATION shows Hough truck-lift mounted on Industrial Tractor. The lift, which is manufactured by the Frank G. Hough Co., Libertyville, Ill., has a lifting platform 26" x 46". It raises a weight of a ton or more from 5½" off floor level to a maximum height of 6' 10" in 10 seconds. Lift can be stopped and held at any height desired.

ANNOUNCE AIR-DRYING INSULATING VARNISHES

A GROUP of air-drying, insulating varnishes named Speedairbonds, designed for use in the manufacture and repair of electrical equipment is announced by The Sterling Varnish Co., 169 Ohio River Blvd., Haysville, Pa. Varnishes are said to dry exceptionally fast to a smooth, glossy finish, to be oil-proof and extremely water, acid and alkali resistant, to possess highest dielectric quality, and to have excellent flexibility and long life. They are fully described in Bulletin 243.

NEW "HI-STRESS" SPEED NUT



NEW Hi-Stress speed nut conforming to AAF specification 25531, has been developed by Tinnerman and approved by the Army Air Forces. This new nut is a lighter weight, one-piece integral unit with an unusually low installation torque that allows speedier insertion of screws and bolts. It is interchangeable with nut plate AN362, for high temperature applications in all structures. It is known as A6103H-1032. Tinnerman Products, Inc., Cleveland 13, Ohio.

RECTANGULAR ROAD SWEEPING MAGNET

A ROAD sweeping magnet, rectangular in shape, available in 18" standard width, and in 60", 72", 84" and 96" lengths, depending on the width of sweep desired, is announced by Stearns Magnetic Manufacturing Co., Milwaukee, Wis. Magnet is equipped with suitable suspension lugs that can be readily adapted to practically all types of vehicles on which the road sweeping magnet is to be used.

NEED ANY HELP *Securing* UNIFORM STAINLESS?



A most important factor in maintaining economical production is the uniformity of the material being fabricated. If you are cold upsetting or machining Stainless Steels, you know that uniformity insures steady trouble-free machining, reduction of tool and die mortality, avoidance of time and material wastage, with rejections cut to a minimum. If you are using Rustless Stainless Steel bars and wire, you know that its uniform high quality, its lot to lot, heat to heat homogeneity pays production dividends.

Rustless service goes beyond the delivery of uniform Stainless Steel. Our service men have helped solve problems in many shops, and our laboratory has studied cutting rates, tooling, lubricants and special finishes. This specialized knowledge is at your disposal. If you have a specific problem, call our nearest District Office.

Rustless

WHEN YOU WANT TO
KNOW MORE ABOUT
STAINLESS
Ask RUSTLESS

RUSTLESS

Producing STAINLESS STEEL Exclusively

RUSTLESS IRON AND STEEL CORPORATION,  BALTIMORE 13, MD.

SALES OFFICES: BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • LOS ANGELES • NEW YORK • PHILADELPHIA • DISTRIBUTORS IN PRINCIPAL CITIES



There's a difference in Morale..



when Washrooms are Sanitary

The war has emphasized the importance of protecting workers' health and welfare. Management recognizes more than ever before how much health and morale affect the speed and cost of production.

West bowl-cleaner service and deodorizing equipment are primary requisites to the maintenance of wholesome sanitary washrooms.

WEST BOWL CLEANER SERVICE West has organized an "army" of trained service men to operate from its branches from coast to coast. They are experienced in using the proper products in the most efficient manner and on a periodic schedule. Thus management may relieve their maintenance crews of this necessary duty and be assured that it will be efficiently and regularly taken care of.

WEST AUTOMATIC DRIP MACHINES are designed to meet the need of proper washroom deodorization in a simple, economical and efficient method. They are placed above toilets and urinals so that an aromatic liquid constantly drops into the bowl, tending to overcome washroom odors at the source.

• Free literature on request

WEST DISINFECTING
Company

42-16 WEST STREET • LONG ISLAND CITY 1 • N. Y. • DEPT. P

• Send for your
copy of this
booklet



"GEON" NAME OF NEW POLYVINYL RESINS GROUP

Announcement is made by the Chemical Division of the B. F. Goodrich Co., Akron, O., that it has selected the name "Geon" for a group of unique polyvinyl resins, which it has developed. The new resins it is said can be processed easily on existing equipment, and will expand the field served by this class of plastic materials. Coating of fabrics, paper, foil and other materials, insulation of wire, manufacture of film for packaging, and the manufacture of extruded and molded products are among the principal fields of the Geon resins. Among the outstanding qualities of plastics made with these resins are the remarkable combinations of rubber-like properties with non-flammability and resistance to oxidation, and deformation at elevated temperatures. Tailor-made formulations can be supplied for special purposes.

1 1 1

DEVELOP ACETATE GROMMETS

Spun acetate grommets, manufactured of acetate film, spirally wound and laminated for greatest strength, have been developed by Precision Paper Tube Co., Chicago, 47, Ill. They are said to provide exceptional insulating properties



Non Shatterable Acetate Grommets

combined with the non-shatterable toughness of the material, along with the advantages of being light in weight and resistant to oil, moisture and all climatic conditions. Grommets are supplied with one end spun, inserted in place, and subsequently spun over on standard drill press equipment with special tools. The heat of the spinning operation shrinks the thermo-plastic material so that a tight fitting, touch permanent insulation results. Further details and samples are available on request.

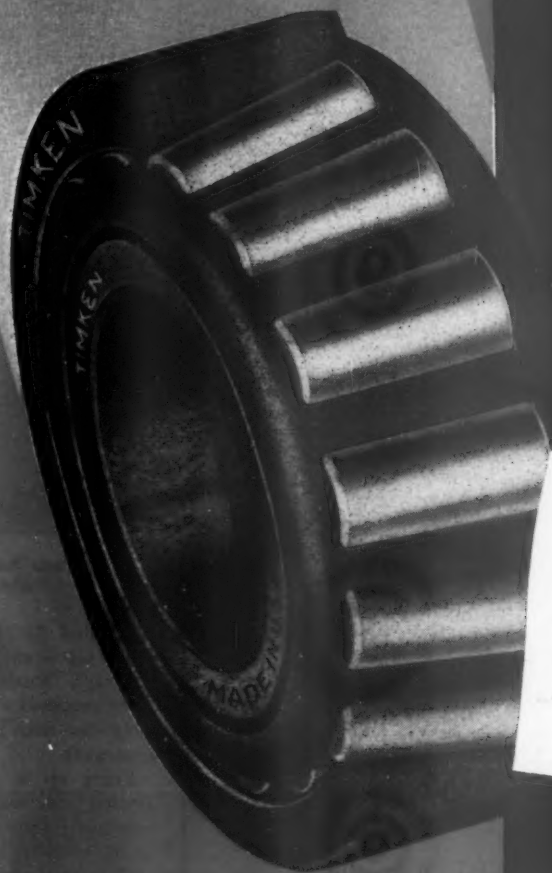
1 1 1

FLUXMETER FOR MEASURING DC MAGNETIC FIELDS

New light-beam-instrument for measuring either flux density or the total magnetic flux in magnetic circuits is announced by the General Electric Company's Meter Division. Applicable wherever permanent magnets or d-c electromagnets are used, the fluxmeter is similar to a light-beam galvanometer, and has a suspension type element. By using search coils which can be easily constructed by the user, it provides a ready means of handling a wide variety of magnetic measurements. It can obtain

(Continued on page 146)

Memo for Tomorrow



DEVOTED to the cause of Victory today, Timken Tapered Roller Bearings again will be available for all requirements — in unlimited quantities — when the time comes to "beat the swords into plowshares".

In the meantime, keep in mind the advantages listed at the right — all combined in the Timken Bearing.

**THE TIMKEN ROLLER BEARING
COMPANY, CANTON 8, OHIO**

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

MEMO HIGH LOAD CAPACITY

Any desired combination of radial and thrust loads.

MEMO SELECTIVITY

Over 3,000 sizes and types to choose from.

MEMO ADJUSTABILITY

To any preload.

MEMO PRECISION

To the necessary degree for any application.

MEMO FIELD ENGINEER- ING SERVICE

Available from strategically located district offices.

MEMO SALABILITY

Timken Bearing Equipped machines preferred and demanded by users everywhere.

New Slide Rules IN PRODUCTION



3 Types * 3 Prices * Immediate Delivery
SIMPLE INSTRUCTION MANUALS INCLUDED

Made for the emergency—they'll do the job—and believe it or not!—you can get 'em right now. Post Slide Rules come in good looking leatherette cases and are accompanied by comprehensible instruction manuals. Read the descriptions below and reach for the phone for fast-action delivery.

1452D. Ten inch Celluloid Face bevel edge slide rule. Inches and metric rules on bevel edges. Scales A, B, C1, C, D and K on slide front. Scales S, L and T on reverse side.

Attractive leatherette case.....List Price \$3.50

1444D. Five inch Celluloid Face POCKET style slide rule. Scales A, B, C1, C, D and K on slide front. Scales S, L and T on reverse.

Leatherette Pocket case.....List Price \$2.25

1446D. Ten Inch Printed Surface slide rule. Inches and metric rules on vertical sides. Scales A, B, C1, C, D and K on slide front. Scales S, L and T on reverse side.

In attractive leatherette case.....List Price \$1.50



DETROIT

The Frederick Post Company

561 E. JEFFERSON AVE.

RANDOLPH 8483

(Continued from page 144)

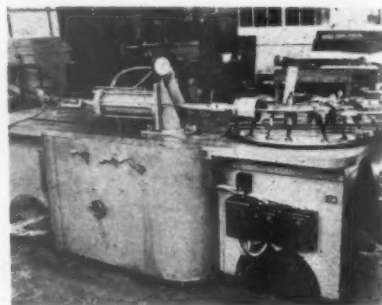
different sensitivities by utilizing galvanometers of various characteristics. Galvanometers are interchangeable, and the instrument has a scale of 50-0-250 millimeters. Bulletin GEA 4157, which describes the fluxmeter and fluxmeter galvanometers and includes drawings of search coils, is available from the company at Schenectady, N. Y.

1 1 1

DEVELOP MACHINE FOR BENDING AND STRETCHING METAL PARTS

A machine for bending and stretching metal parts for aircraft at a speed and economy never attained before has been developed for Goodyear Aircraft Corporation under the direction of J. S. Nielsen, Manager of Experimental Tools and Equipment, Akron, Ohio.

The Roto-Stretcher, as it is called, forms parts without wrinkles due to the



Goodyear Roto-Stretcher forms parts without wrinkles.

controlled force it exerts during operations, Goodyear engineers explained. As a result, costly handwork required by other methods are said to be unnecessary. Only one man is required to operate the apparatus.

Parts up to 360 deg. can readily be formed on the Roto-Stretcher which previously had to be formed in conventional mechanical dies. Goodyear Aircraft engineers say the springback, or change in shape after the part leaves the machine, is negligible, so that uniformity is assured.

1 1 1

NEW METHOD OF "FORMING" THERMOSETTING PLASTICS

A new method of "forming" thermo-setting laminated plastic material manufactured by the Formica Insulation Company for wartime application on airplanes may open a field of many new uses of the formed product. The new "forming" method was developed by William Beach, an engineer of the North American Aviation Company, Engelwood, Cal. to make laminated parts on planes manufactured by his company. The process developed depends on heating the Formica sheet to what is termed "just the right temperature", explained as somewhat higher than the curing temperature and below the point where the laminated sheet blisters.

The Beach process then involves rush-

(Continued on page 148)



Leland Line

The great majority of the motors and generators designed and built by Leland find their way to the various fighting fronts.

Other Leland equipment serves the home front—on pumps, compressors, machine tools, etc. Typical of these applications is the generator on the above giant lathe.

The Leland line includes motors, generators, motor generator sets, inverters and voltage regulators.

Consult Leland. No obligation.

THE LELAND ELECTRIC COMPANY
DAYTON, OHIO

Heavy duty 36" Monarch lathe with Leland Generator to supply D.C. current for operation of magnetic drive clutch, relays, follower switch, etc.

Leland
ELECTRIC

CREATIVE ELECTRICAL ENGINEERING

BACK THE ATTACK — BUY WAR BONDS

Here Comes the Hot Coffee!



Have a Java, Big Boy!

Welcome! You can say that again

There just is no other way to service hot coffee to your workers indoors, outdoors, day shift or night shift, that will match the low cost efficiency of hot coffee service with "Aer-Void" Vacuum Insulated Coffee Carriers.

And is hot coffee appreciated by factory workers? You wouldn't ask the question if you had ever tried it. Just stop and reflect that it takes 91,300,000,000 cups of coffee per year, according to official figures, to satisfy America's coffee-craving, and you have the answer. No other beverage can point to such a pronounced public preference.

No, the "pin-up" girl in our plant is not Betty Grable, not Rosalind Russell, not Deanna Durbin, but the girl in the immaculate white uniform that shows up mid-morning and mid-afternoon with a delicious cup of hot coffee for everybody . . . office and shop. Hundreds of industrial War plants already have "Aer-Void" hot coffee service combating fatigue in their workers. Cold days emphasize the need for this low-cost morale-builder.

Write for price list No. 145

FOOD SERVICE & CONSERVATION DEPT.
VACUUM CAN COMPANY
25 S. HOYNE AVE. - CHICAGO 12, ILL.

"AerVoid"
VACUUM INSULATED CARRIERS
FOR STORING, TRANSPORTING
AND SERVING **HOT COFFEE**

(Continued from page 146)

ing the sheet heated to "forming" temperature, to a press with wooden dies and stamped into shape in less than 15 seconds after it leaves the heating oven. Sharp bends can be made in sheets up to $\frac{1}{8}$ inch thickness with an inside radius no larger than the thickness of the material.

It was disclosed that a large aircraft company on the Pacific coast is making 300 pieces by this forming method.

1 1 1

READY-TO-SET GLASS VEE JEWELS

Previously offered as run-of-mill quality, General Electric glass vee jewels are now ready to set. Before jewels are shipped, they are examined under a binocular microscope which has a magnification of 40 diameters, for incipient flaws in the glass, the depth of the vee and its concentricity. Simultaneously the



Diameters of glass vee jewels are .051" and .076"

bearing is explored for pits or roughness with a fine steel needle. All jewels now furnished have passed this rigid inspection and are ready to be set in jewel screws. This inspection saves the purchaser inspection time. The jewels will resist shocks in excess of those required to damage instrument steel pivots. The jewels have the same coefficient of friction as the sapphire and in combination with instrument steel pivots, under vibration, they often produce less friction increase than does the sapphire. Two sizes of glass vee jewels are now available: diameters of 0.051 and 0.076 inch. Specifications and ordering information is contained in Publication GEA 4134; General Electric Co., Schenectady, N. Y.

1 1 1

CORRODIZING ANTI-CORROSION ELECTROPLATING PROCESS

Corroding is the trade name of a process developed by the Standard Steel Spring Co., Park Building, Pittsburgh, Pa., in which a number of very thin layers of metals and alloys have unusual corrosion resistance, are electro-plated on metal base stocks. The metals and alloys are nickel and zinc and nickel and tin.

It is said to provide a superior rust-resisting process whose cost is not excessive, but which provides a coating said to be at least $2\frac{1}{2}$ times more rust-resistant than coatings in use today. In appearance, the Corronized coating has a silvery semi-lustrous finish. It is ductile, adheres perfectly, and statement is made that it will not peel, crack, or flake when bent around a diameter equal to the thickness of the sheet or when wrapped around its own diameter as in the case of wire. Either ferrous or non-ferrous metals or alloys can be Corronized.

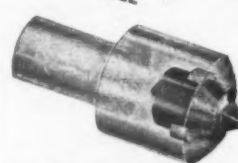
1 1 1

ZINC COATING LIFE INCREASED BY TITANIUM PRE-DIP PROCESS

A mere whisper of titanium is the magic that makes a disodium phosphate dip work as a chemical wipe on zinc for subsequent and final phosphating treatment, increasing the life of zinc coatings fifty-fold, according to Westinghouse engineers. The titanium pre-dip has several advantages for phosphate anti-corrosion treatments. It secures a protective coating on zinc and provides a finish that does not necessarily require further coating. Certain war implements receive a layer of zinc but three ten-thousandths of an inch thick. When given the titanium pre-dip and the normal phosphate coating they are able to meet the 100-hour salt-spray test with ease. Without the titanium pre-dip, cor-

(Continued on page 150)

DIAMONDS for Victory



Cooler dressing
Closer tolerances
Micrometer
Accuracy

Because: Wing key
heat dissipation
and absolute diamond
lock nib.

● Three grades of diamonds. Common quality \$12 per karat. Medium quality \$24 per karat. Select quality \$48 per karat. (Contour template diamonds supplied only in Medium and Select quality.)

All diamond sizes $\frac{1}{4}$ to 10 karat are nib mounted for immediate shipment . . . Billed subject to approval. Specify quality of diamond wanted. We recommend a minimum size of one karat for each 6" diameter of grinding wheel. (24 hour resetting service, \$1.00 post paid.)

Grinders instruction card free.

The Most Complete and Up-to-the-Minute Line of Diamond Tools for War Production. Send for Free Catalog.

Distributed through Mill Supply Jobbers.

DIAMOND TOOL COMPANY, Not Inc.
Sheldon M. Booth, Pres.
938 E. 41st Street CHICAGO, ILL.

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is an
Abrasive Company
VICTORY POINT

If you are a user of abrasive mounted wheels or points, **VICTORY POINTS**, with Demountable Spindles, can save time and money for you while saving war-precious steel for Uncle Sam.

May we tell you more about the **VICTORY POINT**—America's new and amazing industrial tool? Just write on your letterhead for **FREE** Catalog. Please ask for Form **ESA-67**.



COMMANDING QUALITY . . . OUTSTANDING RESULTS

ABRASIVE COMPANY

DIVISION OF SIMONDS SAW AND STEEL CO.

TACONY & FRALEY STS., PHILADELPHIA, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES



A $\frac{5}{8}$ " WILL DO IT--

--with

CHICAGO "SAFETY PLUS"

CHICAGO "SAFETY PLUS" Products, because of their uniformly high tensile strength may be substituted for other standard screws with many resultant advantages.

CHICAGO "SAFETY PLUS" Socket Head Cap Screws of a given diameter can be specified instead of hexagon head or fillister head cap screws of larger diameters. A $\frac{5}{8}$ " diameter CHICAGO "SAFETY PLUS" Socket Head Cap Screw, for example, is more than 38% stronger than a $\frac{3}{4}$ " diameter standard hexagon head or fillister head cap screw. In addition to greater strength, assemblies are lightened and the smaller heads with internal wrenching permit of the locating of screws in critical areas which are too small for protruding hexagon heads.

The complete line of Chicago "Safety Plus" Socket Products includes Socket Head Cap Screws, Socket Set Screws, Pipe Plugs, Stripper Bolts and Square Head Set Screws.



*These Fine Products
are sold only thru
Authorized Distributors*



THE CHICAGO SCREW CO.

ESTABLISHED 1872

1026 SO. HOMAN AVENUE

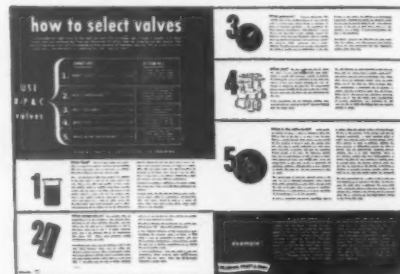
CHICAGO, ILL.

(Continued from page 148)

rosion appears in an hour or two. Phosphating with titanium pre-dip is much faster than the electroplating-enameling process, less expensive, requires no critically short copper, and is many times more protective.

1 1 1 VALVE SELECTION CHART SIMPLIFIES SELECTION

New valve Selection Chart just released by the Reading-Pratt & Cady Division of the American Chain & Cable Co., Inc., Bridgeport, Conn., is said to be ideal for shop training or for a re-



Size of chart issued by Reading-Pratt & Cady Div. is $11\frac{1}{2}$ " x 17".

fresher on valves. The chart is available on heavy cardboard, size $11\frac{1}{2}$ " x 17". Easy to follow—easy to understand, the chart explains the conditions to consider when selecting a valve and breaks down these conditions to determine how they affect the operation of the valve. Copies available without cost—say how many you can use.

1 1 1 MULTIPORE—FILTER MATERIAL 6400 PERFORATIONS PSI

Multipore, filter material containing as many as 6400 perforations per square inch, has been developed by United States Rubber Co., Rockefeller Center, New York. These filter screens are made of either hard or soft rubber, and may be compounded to resist abrasion, high temperatures, alkaline and acid solutions, as well as certain oils and greases. Since they are made only from natural rubber latex of the Hevea tree, now one of the most critical of all materials, the filter can be applied only to the most important products. It is now being used by chemical plants, food factories, medical manufacturers, coal and iron mines, steel mills, liquor distillers, and many other types of industry.

1 1 1 CARRIER GETS PATENT ON "THINKING" VALVE

The United States Patent Office has issued patent No. 2,342,328 to Dr. Willis H. Carrier, Carrier Corporation, Syracuse, N. Y., covering a "thinking" valve. The valve is said to anticipate the requirements of any room by admitting to an air conditioning unit, cold or hot fluids in exactly the desired amount auto-

(Continued on page 152)

For LIGHTWEIGHT

N-A-X

HIGH TENSILE



IT HAS

1. High Strength and Impact Properties
2. Outstanding Ductility
3. High Vibration Fatigue Resistance
4. Excellent Welding Characteristics

Send for booklet describing N-A-X HIGH TENSILE
and N-A-X 9100 SERIES ALLOY STEELS



GREAT LAKES STEEL CORPORATION

DETROIT, MICHIGAN

Sales Offices in Principal Cities

Division of NATIONAL STEEL CORPORATION Executive Offices, Pittsburgh, Pa.

40 YEARS EXPERIENCE *wrapped up with every foot of* CONTINENTAL HOSE



In Hose Making there is no substitute for experience. The finest materials, methods and facilities are not enough—it's still primarily a matter of experience to build industrial hose that will stand the gaff. That's true regardless of the hose you use—suction, steam, water, air, vacuum, gasoline, oil or fire hose. Continental provides the right hose for the job and serves you through its nearby factory branch warehouses.



Baltimore, Md.
Boston, Mass.
Buffalo, N. Y.
Chicago, Ill.
Cincinnati, Ohio

Cleveland, Ohio
Dallas, Texas
Dayton, Ohio
Detroit, Mich.
Indianapolis, Ind.

Kansas City, Mo.
Los Angeles, Cal.
Memphis, Tenn.
Milwaukee, Wis.
New York, N. Y.

Philadelphia, Pa.
Pittsburgh, Pa.
Rochester, N. Y.
San Francisco, Cal.
St. Louis, Mo.

CONTINENTAL RUBBER WORKS
ERIE, PENNSYLVANIA, U. S. A.

(Continued from page 150)

matically, and with no need for change in setting throughout the year. Once it is adjusted, the valve will assure proper compensation for changes in weather conditions or for variations in requirements of the air conditioning system arising from the number of people in a room.

The valve will also fill a need in industrial uses. The same control apparatus is adapted to admit cold or refrigerated liquid in one flow circuit under conditions requiring cooling, and will admit warm or heated liquid in another flow circuit under conditions requiring heating, both circuits feeding to any desired air conditioning or industrial processing units.

1 1 1

SPECIAL AIR FORCE FLASHLIGHT

The special-type flashlight illustrated, in use by the Army Air Forces, has three main parts molded of Tenite, the body, bottom cap, and top. The light bulb is housed at the end of a flexible



Tenite used in AAF Flashlight.

metal tubing which makes it possible to place a direct beam of light close to hard-to-get-at points of inspection and the inside of motors, etc. Tenite is a cellulose acetate butyrate product of Tennessee Eastman Corp., Kingsport, Tenn. The flashlight case is molded by Standard Molding Corp., Dayton, Ohio.

1 1 1

"V-FILM" NEW PACKAGING MATERIAL

Utilizing a base of plastic resin, a new packaging material named "V-film" has been announced by the Goodyear Tire & Rubber Co., Akron, Ohio. Although not a substitute, it is characterized as an alternative in some of the packaging applications for Pliofilm. It is not the equal of Pliofilm in some respects for moistureproof packaging, but is described as being superior in tear resistance and other factors. It is said to be especially adaptable for fabrication where stitching and sewing are required.

1 1 1

WATER-FREE HYDROCHLORIC ACID OVER 99% PURITY

A new, more economical process for making water-free hydrochloric acid of over 99 per cent purity without explosion hazard is announced by the Grasselli Chemicals Department of E. I. du Pont de Nemours & Company.

Among advantages of the new process (Continued on page 154)

FOR UTMOST WIRING PROTECTION



GENERAL ELECTRIC RIGID CONDUIT

General Electric offers two conduits—each a leader in its class. Uniform high quality and dependability are assured by modern manufacturing processes and skilled craftsmen.

G-E WHITE RIGID CONDUIT is hot-dipped galvanized and Glyptal-coated inside and out. This method of manufacture provides a heavier coating of zinc than could be applied in any other way and bonds the zinc to the steel.

G-E BLACK RIGID CONDUIT is coated inside and out with tough asphaltic-base enamel which remains chemically inert in the presence of corrosive liquids or fumes.

G-E Conduits are made of mild steel tubing and are easy to bend and to install. Proper boxes and fittings are available.

FOR FURTHER INFORMATION

on G-E Rigid Conduit, Electrical Metallic Tubing, Building Wire or Wiring Devices, see the nearest G-E Merchandise Distributor or write to Section CDW-447-77, Appliance and Merchandise Dept., General Electric Co., Bridgeport, Conn.

BUY WAR BONDS



G-E ELECTRICAL METALLIC TUBING

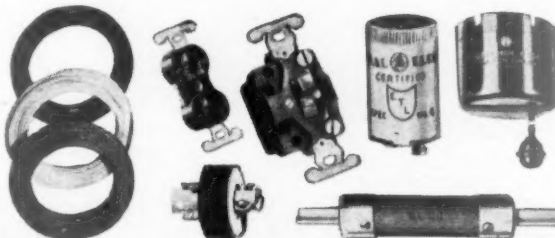
G-E high quality electrical metallic tubing is ideal to use for wiring system protection when chances of mechanical injury or corrosion are not severe. It is manufactured from open hearth steel and is electro-galvanized on the outside and black enamelled on the inside. It bends easily and accurately. Compression fittings are available.

HEAR the General Electric radio programs: "The G-E All-girl Orchestra" Sunday 10 p.m. EWT, NBC. "The World Today" news every weekday 6:45 p.m. EWT, CBS.

G-E BUILDING WIRES AND WIRING DEVICES

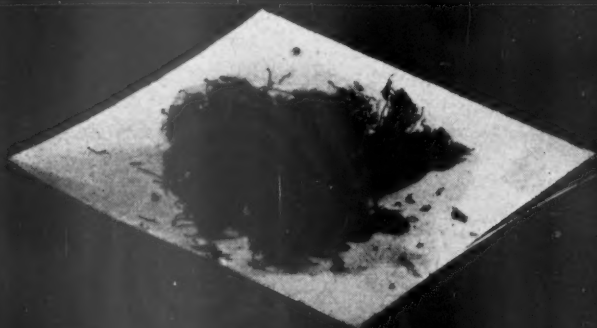
Included in the G-E line are building wires and wiring devices for every purpose: Flamenol* Type SN small diameter building wire with thermo-plastic insulation, other wires and switches lampholders, outlets, fuses, etc.

*Reg. U.S. Pat. Off.



GENERAL ELECTRIC

From this



To this



takes more than **MACHINERY!**

Under ordinary conditions, anybody can buy raw plastics and molding machinery and go into the plastic molding business.

But they can't buy what we have here at General Industries . . . and that's *experience*. (Call it "know-how" if you want to.) They can't take a barrel or a ton of raw materials and turn it into intricate, complicated castings.

Experience recognizes the characteristics of the various kinds of plastic materials . . . selects the best one for the job in hand. Likewise, it knows the intricacies of making molds with micrometer tolerances, in all sorts of shapes and sizes, with inserts that must be accurately placed. And, experience knows the right machines to do the job on, to turn out finished products exactly to specifications and on time. Perhaps most important, experience knows what *is* a plastic job and what *isn't*!

That's what we have at General Industries. Of course we have presses, large ones and

small ones. Presses that will turn out the work as perfectly as we have turned out the molds, and in the most economical way.

So—if you have a plastic problem on a postwar product, perhaps we'll be able to help you. Right now, our men and presses are busy helping Uncle Sam finish up the work in hand. But later . . . we'll want work to keep them busy. We'll have engineers that will help you fit plastics to the job you want them to do. We hope you'll call on us.

THE

**GENERAL
INDUSTRIES
COMPANY**

MOLDED PLASTICS

Molded Plastics Division • Elyria, Ohio

Chicago: Phone Central 8431
Detroit: Phone Madison 2146

Milwaukee: Phone Daly 6818
Philadelphia: Phone Camden 2215



CHICAGO MOUNTED WHEELS and SMALL GRINDING WHEELS

A complete range of styles, grains and sizes up to 3" in diameter to give you a perfect finish on every job.

PROMPT DELIVERY

Specialization—with full WPB approval—on sizes 3" in diameter and under, means no waiting for Chicago Grinding or Mounted Wheels. Let us take care of your present and post-war requirements.

**YES, YOU CAN FINISH IT
BETTER WITH A CHICAGO
WHEEL**

FREE ENGINEERING ANALYSIS

If you have a grinding job that presents a problem because of the nature of material, tricky shape or other reason, tell us about it. Our experts will go into a huddle and give you the benefit of our long experience making millions of custom built wheels for every conceivable operation.



Half a Century of Specialization has Established our Reputation as the Small Wheel People of the Abrasive Industry.

Just as the prelude to a new world is better tools of war, so the prelude to a perfect finish is better grinding wheels.

Today's standards of finishes are far and beyond those of yesterday. To acquire them without sacrifice of production time is a goal which everyone seeks.

Finish must now be measured in micro inches. That's where the new Chicago **FV BOND** Wheels excel. They give a precision smoothness so intensified that it passes any surface analyzer test, in many cases eliminating hand lapping and auxiliary finishing operations.

HERE'S WHAT MAKES CHICAGO WHEELS CLICK —

A—Sensational new **FV BOND**. Result of research and experiment on hundreds of aircraft jobs.

B—No sacrifice of cutting time or wheel life.

FV BOND is available in all types of Chicago Mounted and Small Grinding Wheels — in all abrasives, grain and grade combinations.

TEST WHEEL FREE — To prove their superiority in your own shop, send for a Chicago Wheel made with **FV BOND**. Give us details of the job, material you want to finish and we'll do the rest.

Write for Catalog and interesting Engineering Survey Form

CHICAGO WHEEL & MFG. CO.

1101 West Monroe Street, Dept. PG-4, Chicago 7, Ill.

(Continued from page 154)

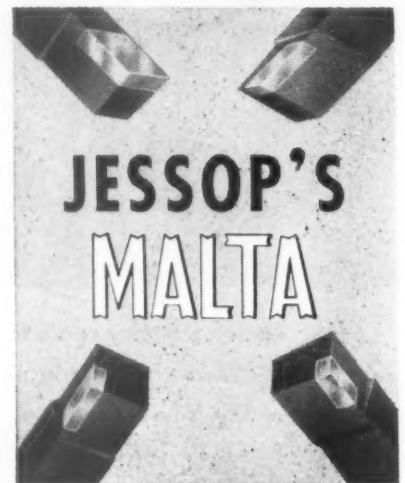
mental work that may be assigned by the War Metallurgy Committee of the National Research Council; research projects that have a bearing on the war for the eight operating divisions of the American Brake Shoe Company. After the war the principal activity of the foundry will be experimental and research work for Brake Shoe and its customers.

At all times, the foundry is intended to be a changing, modern exhibit of good foundry practices.

1 1 1

JESSOP STEEL ANNOUNCES MALTA CARBIDE TIPPED TOOLS

Jessop steel Company, Washington, Pa., announces Malta Carbide Tipped Tools, a line of cemented carbides for cutting steel, cast iron, non-ferrous and non-metallic materials, rounding out the Jes-



Three grades of carbide tipped tools

sop service to the metal working industry. The tools are manufactured in ten different styles in a wide range of sizes and three grades of tips, MF for miscellaneous finishing, SF for steel finishing, and CR for coarse roughing. The three grades are distinguished by colored shank ends, and tools are rust proofed.

1 1 1

LIGHTING HANDBOOK ISSUED BY WESTINGHOUSE

Because of the demand for information on wartime lighting, Westinghouse Lamp Division, Bloomfield, N. J., has issued a 175-page "Lighting Handbook", which is designed as a practical guide and working reference book. The book is divided into two parts, chapter headings in the first section including: Lighting Terms and Measurements, Recommended Levels of Illumination, Interior Lighting Design Calculations, Interior Wiring for Lighting. The second half of the book is devoted to specific lighting applications.

The book sells for \$1.00. Only a limited number of copies are available. It may be obtained through Westinghouse district offices.

(Continued on page 158)

Send Catalog and Survey Form, Interested in

- ☐ Grinding Wheels
☐ Mounted Wheels
☐ Send Test Wheel

Size

ADDRESS

NAME



Ever try to wring a lamp bulb's neck?

1. In some industrial plants and in outdoor locations, atmospheric conditions sometimes made it difficult to remove burned-out lamp bulbs. Occasionally the glass bulb would come loose, leaving the brass lamp base in the socket. Then G-E engineers built a machine that would "wring a lamp bulb's neck."

2. The average person applies only about 5 inch pounds of torque when he screws in a bulb. With data from this machine G-E engineers developed a basing cement that normally stands up to 100-150 inch pounds! Machine holds base of lamp firmly in socket while increasing twist is applied to bulb. Scale measures force required to separate bulb from base.



3. A similar device is used to insure the strength of the basing cement in G-E Fluorescent lamps. The torque test is only one of the more than 480 tests and inspections that guard the uniform high quality of G-E Mazda lamps—with a vigilance that never relaxes. And each of them is one more reason to be sure you get lamps that wear the G-E Monogram.

THE BEST INVESTMENT IN THE WORLD IS IN
THIS COUNTRY'S FUTURE — BUY WAR BONDS

**"TO MAKE LAMPS
STAY BRIGHTER LONGER"**
The Creed of G-E RESEARCH



G-E MAZDA LAMPS
GENERAL  ELECTRIC

Hear the General Electric radio programs: "The G-E All-Girl Orchestra" Sunday 10 p. m. EWT, NBC; "The World Today" news, every weekday, 6:45 p. m. EWT, CBS.



PRODUCTION UP
COSTS Down

with Titan Hot Pressed Parts

★ Intricate shapes, thin sections, dimensional accuracy. No sandpits, blowholes or sand particles to impair machining or cause failure under stress or strain. Easy machinability with minimum scrap keeps cost of finished parts down. Titan's faultless machining delivers finished parts all ready for your assembly, or you can do your own machining if you wish. Metallurgical Control, engineering skill, craftsmanship in manufacture, personalized service, promptness... all are available from Titan. Experts in non-ferrous metals for over a quarter of a century.



"TITAN WILL DELIVER THEM FINISHED IF YOU WISH"

Titan

METAL MANUFACTURING CO., BELLEFONTE, PA.
NEW YORK • CHICAGO • SAN FRANCISCO

Quality Alloys By Brass Specialists

Brass and Bronze Rods • Forgings • Die Castings • Welding Rods

(Continued from page 156)

LIGHT-WEIGHT FILLING MATERIAL

Typha is the name of a light-weight filling material obtained from common marshland cattail, developed by the Burgess-Manning Co., Chicago, Ill. It is being used in cushions, life preservers, flying suits, and other products.

1 1 1

PLASTIC RIVETS 1/8" TALL

Injection molded rivets of cellulose acetate, approximately 1/8" high and 100/1000" thick, are being produced in a 200-cavity die at only one-third the former cost of nickel rivets, according to the Cellulose Products Department, Hercules Powder Co., Wilmington, Del.

1 1 1

AIR CONDITIONING MAINTENANCE

Maintenance of air conditioning and humidifying equipment in metal-working plants, hospitals, textile mills, food plants, bakeries, dairies and a number of other industries is discussed in a feature article in the January-February, 1944, issue of Oakite News Service, published by Oakite Products, Inc., 54 Thames St., New York, N. Y. It gives data on how effective cleaning and related techniques help solve the four major problems of scale, slime, odors and corrosions, based on case histories. Copies are available to Purchasing Agents interested.

1 1 1

SLIDE RULE FOR AIR CIRCUIT BREAKERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis., offers a slide rule for a simplified means for determining the correct size of air circuit breakers for all industrial substation applications. With the Allis-Chalmers Unit-Sub rule it is said that anyone can easily calculate the interrupting capacity of the 60-volt class air circuit breakers needed for control of power in all industrial plants. The rule takes into consideration all necessary factors, such as motor load and d-c component. It can be used to check breakers on any system. The same engineering information which is contained in the Rule is also available in Monogram form in the manufacturer's unit substation bulletin B6285. Slide rule or bulletin will be sent on request.

1 1 1

START VOLUME PRODUCTION OF SYNTHETIC RUBBER BELTING

The start of volume production of industrial belting made with synthetic rubber is announced by United States Rubber Company at its plant in Passaic, New Jersey.

This program of mass manufacture of synthetic rubber belting is designed to alleviate the shortage of transmission and conveyor belting which threatened war industries when sources of natural rubber were shut off with the capture of the plantations by the Japanese in the southwest Pacific.



THE OTHER HALF IS **KNOW HOW**

Metal plus work plus heat-treating make a spring. Specifications say so. But there's something else that makes the spring more than acceptable. It's the careful inspection of materials, the skilled design of tools and dies, the right kind of heat-treatment. You don't learn to make springs from a recipe. That may give you the ingredients—but only a desire to make the best springs can produce the kind that "stay sweet" longer. Gibson spring engineers have that desire, our skilled workmen "know how."

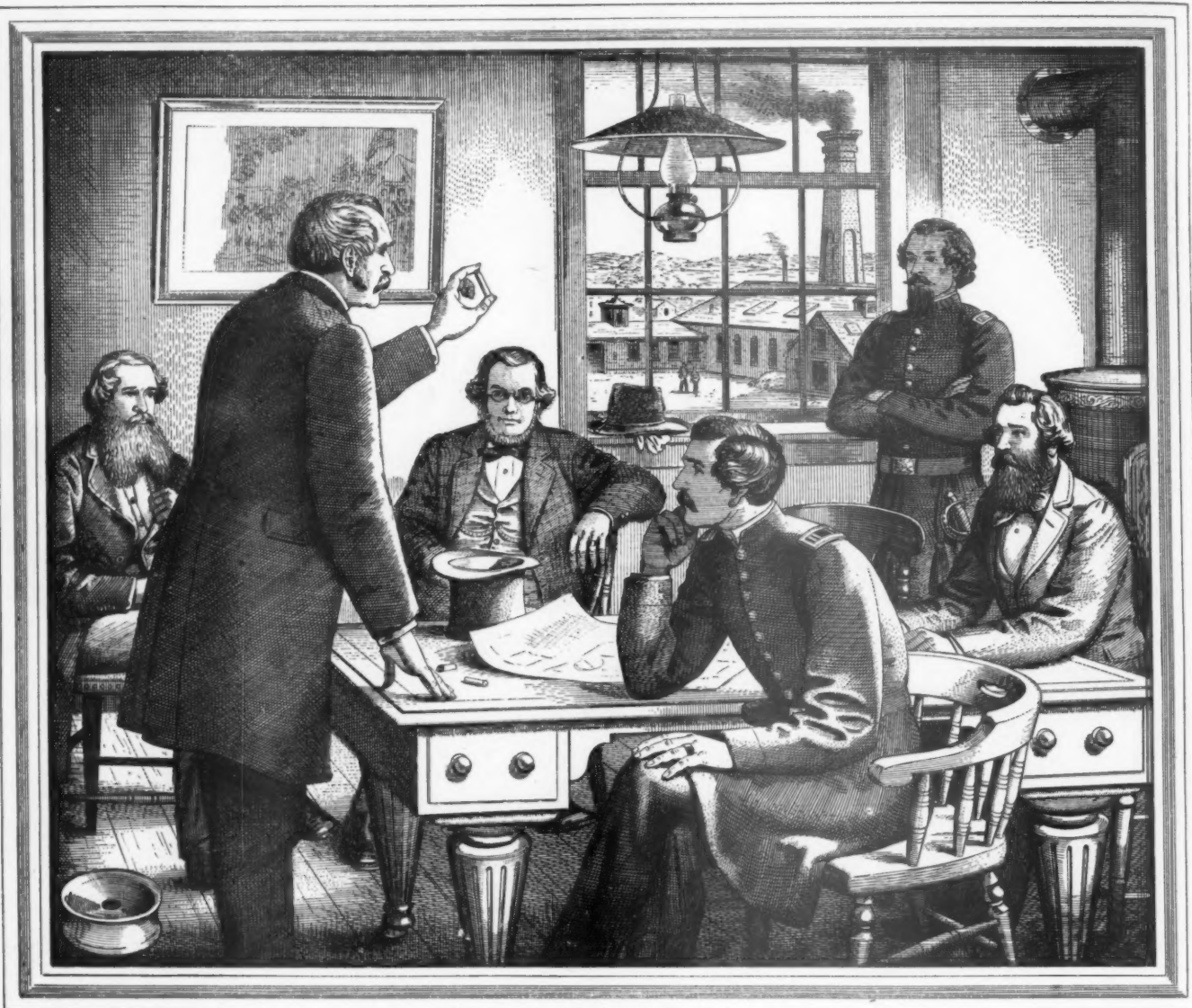


BUY
WAR BONDS

GIBSON-SPRINGS

THE WILLIAM D. GIBSON CO.
DIVISION OF ASSOCIATED SPRING CORP.

1800 Clybourn Avenue, Chicago, Illinois



*"You make General McClellan's munitions
...we'll make your new cartridge BRASS"*

THE birth of packaged death occurred in the office of a New England munitions maker soon after the start of the War Between the States, in the Union's darkest hour. The munitions men had developed the idea of the rim-fired brass cartridge . . . but couldn't start a new brass mill under pressure of wartime demands. So the Connecticut brass industry took over the development and production of special brass for this critical use. Then followed the repeating rifle and carbine . . . replacing paper cartridges and hand-rammed powder

and ball . . . tipping the scales of the Union cause with a dependable, deadly advantage. Conceivably, the war was won on that spring day of 1862.

Ever since, the Naugatuck Valley has been the No. 1 brass arsenal for ammunition makers. And in this, the fifth war in which Bristol Brass has served as a member of America's industrial gun crew, the same situation exists now as then . . . except that Bristol Brass sheet, rod and wire now rolls to the ends of the earth, clicking smoothly into the gun-breeches of the troops of a score of Allied Armies,

instead of one small force along the Potomac. Today, corps commanders and skippers of fighting ships take for granted what McClellan's staff hailed as a miracle . . . the fact that good Connecticut Yankee brass ammunition can take soaking, baking, and kicking around . . . and still leap with a shout from the trigger, whenever a free man's finger presses down in mortal need.

**THE
BRISTOL BRASS
CORPORATION**

Makers of Brass since 1850, Bristol, Conn.



CLEVELAND Aircraft Bolts

Specializing in AN Hex Head Aircraft Bolts, Cleveland is producing millions of bolts with or without drilled shanks and heads, in all standard sizes. Made to Army and Navy specifications, of course, but with the extra strength added

by Kaufman Process manufacture... Many of your specially designed parts and fasteners can be made now to better advantage by our improved cold forming methods. It pays you to let us check your specifications for "specials."

Send for Aircraft Bolt folder

**CLEVELAND
FASTENERS**

The Cleveland Cap Screw Company

AIRCRAFT PARTS DIVISION

2917 EAST 79TH STREET • CLEVELAND 4, OHIO



Capacities from 1/4th to 1 ton. Available for plug-in on 110, 220 or 440 volt circuits. One-hand control. Prices from \$130.

Materials handling is said to represent the largest single labor cost in industry—the largest single use of manpower. CM Comet Electric Hoists can make this same man (and woman) power more productive, more efficient and with less fatigue. From "receiving", through the production line, to "shipping", CM Comets are doing an outstanding job in making both ends meet. Write today for CM Bulletin 138 for entire illustrated details.

CHISHOLM=MOORE

HOIST CORPORATION

(Affiliated with Columbus-McKinnon Chain Corporation)

GENERAL OFFICES AND FACTORIES: 136 Fremont Ave., TONAWANDA, N. Y.
SALES OFFICES: New York, Chicago and Cleveland

WPB-OPA DIGEST

Synthetic Rubber Plants—WPB—Rubber Director Dewey announces that \$30,000,000 worth of improvements are to be made in plants producing synthetic rubber and its raw materials during 1944. Highest priorities have been granted to this scheduled construction and installation.

Rating Order P-19-H Clarified—WPB—Issuance of Interpretation 1 to Preference Rating Order P-19-h, which points out authorizations on CMPL-224 or GA-1456 is equivalent of a P-19-h authorization, is announced.

CMP Returns Rule Modified—WPB—Rules governing returns of excess or unused allotments of controlled materials have been modified to bring them into conformity with WPB's decentralized operations, according to announcement by WPB Controlled Materials Plan Division. Direction 21 to CMP Reg. 1 as amended.

New Glass Container Quotas—WPB—WPB has set 1944 quota for new glass containers for non-alcoholic beverages at 80% of number accepted by packer in 1941 for use, and the quota for new glass containers for wines and distilled spirits at 100% of number used in 1943. For malt beverages, quota is set at 100% of number of returnable bottles accepted by packer in 1943 for this use. Order L-103-b as amended.

Furniture Shellac Available—WPB—WPB announces that applications will be accepted for shellac to be used in manufacturing and repairing furniture.

Renegotiation Reserves—War Department—Navy Department—Treasury Department—Maritime Commission—War Shipping Administration—Reconstruction Finance Corporation—Reserves for renegotiation refunds which war contractors may set up and show in their statements and annual reports are not to be regarded by Government renegotiation officials as binding on contractors, according to ruling by Joint Price Adjustment Board, representing six Federal renegotiation agencies.

Welding Equipment Rule Modified—WPB—WPB announces that Limitation Order L-298 has been amended to require filing of WPB-1319 as authorized form for delivery of resistance welding equipment.

Container Machinery Restricted—WPB—All deliveries of new and used container machinery, including that used for packaging and labeling, can closing, can making, glass jar and bottle making and cleaning or reconditioning, have been restricted.

Civilian Paper Towels—WPB—Reduction of 1944 manufacture of paper towels
(Continued on page 166)

Caustic Soda



Penn Salt Liquid Caustic Soda is shipped in tank cars specially designed for speedier, safer unloading. These modern 8000-gallon tank cars have a protective lining, are insulated and are equipped with caustic resistant valves and interior fittings. They can be quickly and completely emptied—no wasted caustic, no lost time.

Penn Salt Caustic Soda is supplied as 50% and 72.73% solutions in tank car quantities; as a solid in 750 lb. drums; or in flake form in 400 lb. and 125 lb. drums.

Our technical staff is at your service for help with handling problems. Write for complete information.

OTHER PENN SALT PRODUCTS

Sodium Hypochlorite • Hydrogen Peroxide • Soda Ash • Sulphuric Acid • Hydrochloric Acid • Carbon Bisulphide • Ammonium Persulphate • Anhydrous and Aqua Ammonia • Acids • Ammonium Alum • Bleaching Agents • Carbon Tetrachloride • Corrosion-resisting Cements • Chlorine • Ferric Chloride • Fluorides and Fluosilicates • Kryolith Flux and Opacifier • Kryocide Insecticide • Salt (Ca and Mg free) • Salt Cake • Sodium Aluminate • Sal Ammoniac

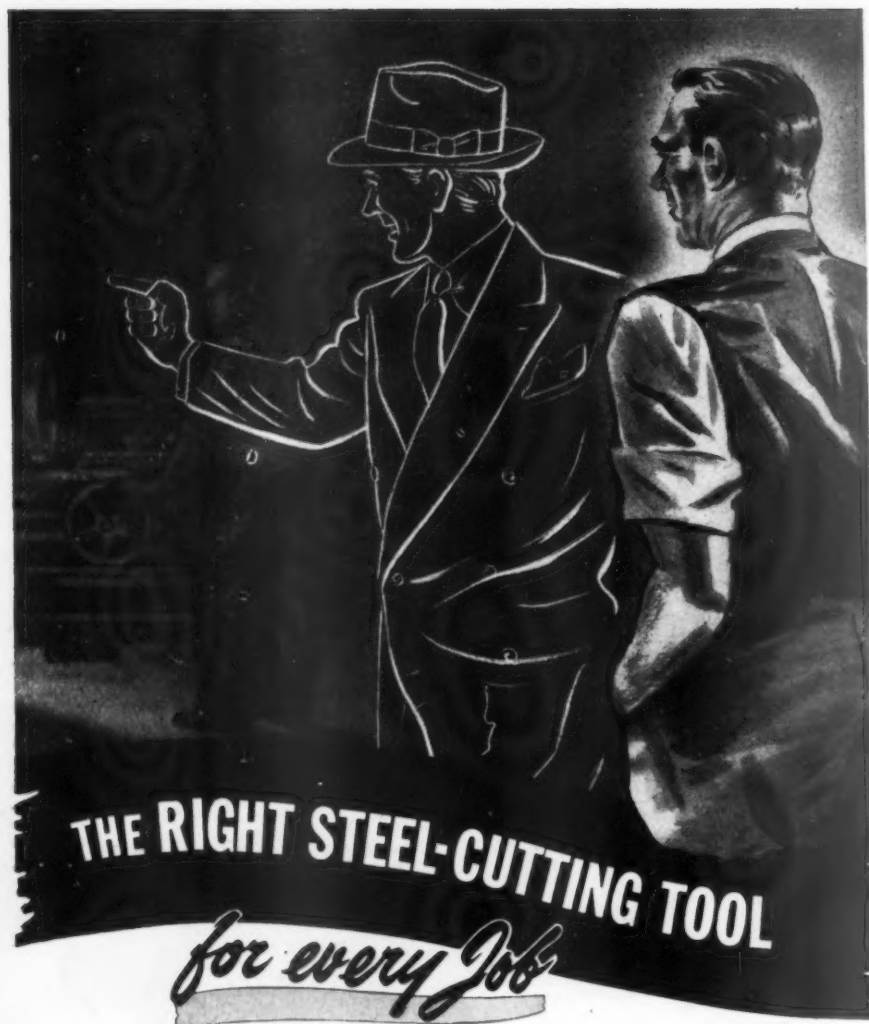
PENNSYLVANIA SALT
MANUFACTURING COMPANY

Chemicals

1000 WIDENER BUILDING, PHILADELPHIA 7, PA.

NEW YORK • CHICAGO • ST. LOUIS • PITTSBURGH • MINNEAPOLIS • WYANDOTTE • TACOMA





To get maximum steel-cutting production—consult KENAMETAL field engineers about the proper application of KENAMETAL, the wear-defying tool material whose chief ingredient is a unique, super-hard intermetallic compound (tungsten-titanium carbide). KENAMETAL engineers will help you . . . (1) select the right grade . . . (2) choose the correct tool style . . . (3) determine the most efficient machine set-up . . . (4) install a money-saving tool maintenance program.

Yes, KENAMETAL engineering service assures the right KENAMETAL tool on every job . . . and performance studies show that the right KENAMETAL tool, used properly, often can remove stock from the toughest steel up to $3\frac{1}{2}$ times more efficiently than other carbides! There's a KENAMETAL field engineer in your locality. Ask him for advice—and always keep a copy of our Tool Manual on hand. Write for one today.



KENAMETAL Inc.
599 LLOYD AVE., LATROBE, PA.

SUPERIOR CEMENTED CARBIDES

KENAMETAL FIELD ENGINEERS in these cities are at YOUR SERVICE

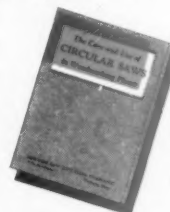
- CALIFORNIA—San Francisco—Yukon 2907
Los Angeles—Lafayette 1229
- COLORADO—Denver—Keystone 7229
- CONNECTICUT—Hartford—W. Hartford 3-6669
- GEORGIA—Atlanta—RA-6477
- ILLINOIS—Chicago—State 4263
Rockford—Forest 890
- INDIANA—Indianapolis—Market 2523-2524
- LOUISIANA—New Orleans—Raymond 5612
- MASSACHUSETTS—Boston—Hubbard 4479
Springfield—Springfield 4-2981
- MICHIGAN—Detroit—Trinity 1-7011
- NEW YORK—New York—Worth 2-0029
Rochester—Stone 7173
- OHIO—Cincinnati—Jefferson 8612
Cleveland—Main 1532
- PENNSYLVANIA—Erie—Erie 23-385
Philadelphia—Baldwin 3442
Pittsburgh—Churchill 6967
- TEXAS—Dallas—Central 6546
Houston—Woodcrest 6-5029
- WASHINGTON—Seattle—Main 5253
- WISCONSIN—Milwaukee—Marquette 0801

IN THESE 7 WAYS...
Extra Wood-Cutting Performance
IS PACKED INTO
SIMONDS "Red Center" Solid Circular Saws



1. *Special Steel* is poured in Simonds own electric furnaces, to produce *uniformly* the toughest of all saw steels.
2. *Scientific Hardening* brings out the edge-holding qualities of Simonds Steels . . . keeps the saw-plates flat without need for harmful hammering.
3. *Hydraulic Rotary Grinding* produces flat and balanced saws which run true and cut higher-grade lumber.
4. *Tensioning* is done under unvarying lighting conditions by skilled anvil men.
5. *Careful Forming* . . . gullets, face, and back bevels are sharpened by modern methods and machines to give longest and smoothest cutting between regrindings.
6. *Triple Inspection* is made for grinding, fitting, and tension.
7. *Controlled-Conditions Plant* . . . with constant light, temperature, and humidity . . . makes for more accurate work. Get the benefit of these 7 Simonds extras on *your* sawing operations. Get "Red Center" Saws from your dealer or from the nearest Simonds office:

BRANCH OFFICES: 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 228 First Ave., San Francisco 5, Calif.; 311 S. W. First Ave., Portland 4, Ore.; 520 First Ave. So., Seattle 4, Wash.; 31 W. Trent Ave., Spokane 8, Wash.



FREE BOOK tells how to get the utmost out of Circular Wood Saws . . . ask your dealer for a supply for your mill men.

SHORTEN THE WAR



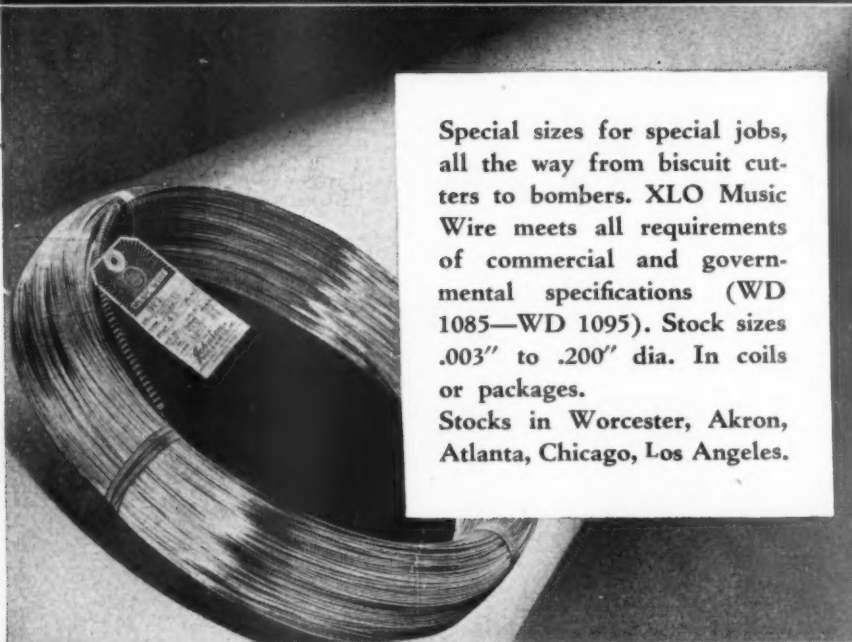
BUY BONDS

SIMONDS
SAW AND STEEL COMPANY
 FITCHBURG, MASSACHUSETTS

PRODUCTION TOOLS FOR CUTTING METAL, WOOD, PAPER, PLASTICS

JOHNSON XLO

Music Wire



Special sizes for special jobs, all the way from biscuit cutters to bombers. XLO Music Wire meets all requirements of commercial and governmental specifications (WD 1085—WD 1095). Stock sizes .003" to .200" dia. In coils or packages.

Stocks in Worcester, Akron, Atlanta, Chicago, Los Angeles.

JOHNSON STEEL & WIRE CO., INC.

WORCESTER 1, MASSACHUSETTS.

NEW YORK ATLANTA AKRON CHICAGO LOS ANGELES

Speeds Production

IN ALL TYPES OF PLANTS

BURGESS

vibro-tool

(Trade Mark Reg. U. S. Pat. Off.)

For MARKING, FILING, CHISELING, HAMMERING, GROOVING SOFT METALS.

On production and assembly lines, in the tool-room . . . for superintendents — inspectors, Vibro-Tool quickly cuts identifying numbers on parts; engraves names on identification disks; cuts cloth patterns; engraves on glass; cuts rubber patterns, etc. EVEN HARD STEEL EASILY MARKED BY USING OUR SPECIAL TANTALUM NEEDLE.



New Weighted Grip

Permits deeper markings in metals, eliminates recoil and provides a better balance. Tool uses vibration principle. 120 vertical strokes per second; 60 cycles operating from 110V AC outlet. Thousands of Burgess Vibro-Tools are speeding production in war plants on all types of jobs, as well as performing important tasks in commercial operations.

NOW CARRIED BY DEALERS AND JOBBERS . . . BUT IF UNABLE TO SECURE, ORDER DIRECT.
Sold on Priority Only. Orders filled immediately.
HANDICRAFT DIVISION

BURGESS BATTERY COMPANY

174 N. Wabash Avenue

Chicago, Ill.



Portable; weighs only 1 lb. Price complete \$7.50, for carton containing tool and ordinary needles. Special needles, cutting points and other accessories available at reasonable extra cost.

(Continued from page 162)

permitted for home use from 100 to 80% of 1942 base period output, is announced by WPB. GCOM-241a, as amended.

Ethyl Alcohol Rule Clarified—WPB—WPB warns purchasers against misinterpretations of allocation order M-30, as amended February 3, which are causing some to conclude erroneously that small order exception of 7,900 gallons per quarter is established. 7,900 gallon figure is quantity limitation concerned solely with methods of obtaining delivery.

Production of Safes—WPB—Advance planning for limited production of safes and insulated files, whenever this may prove possible, was begun in first meeting of newly organized Safe and Insulated File Industry Advisory Committee.

Idle Construction Machinery Needed—WPB—Military, Lend-Lease and essential civilian demand for heavy construction machinery is expected to increase, and this places upon all owners of used construction machinery patriotic duty of selling their idle equipment, according to Director Hall of WPB Construction Machinery Division.

Acetone Pricing Changes—OPA—Reduction of one-half cent per pound from 1½ to one cent, in differential for car-load sales in drums by domestic producers of fermentation acetone over maximum price for sales in tank cars is announced by OPA. Amendment 6 to MPR 36.

Tool Joint Orders Freed—Dept. of Interior—Tool joints may now be ordered from suppliers without obtaining preference ratings, PAW announced as it changed requirement contained in Preference Rating Order P-98-b. Future procedure will be similar to that now used to procure rotary bits.

Steel Drums — Molasses — WPB—WPB announced relaxation of prohibition against use of steel drums for shipment of molasses. Direction 1 to Limitation Order L-197 on steel shipping drums provides that used drums owned by farmers may be used to pack molasses for use by farmer in his own ensilage.

Certain Steel Control Eased—WPB—Producer of steel in controlled material forms and shapes may accept orders for delivery of his products in excess of amounts that he is ordinarily permitted to accept under WPB regulations if he is able to fill orders from stocks that are available in his mill, CMP Division of WPB announces.

Cellulose Acetate Rule Tightened—WPB—In order to provide stricter controls over virgin material and break up black market in scrap, which is reported to be driving up prices and providing encouragement for waste, WPB has placed

(Continued on page 168)

Leather serves best

In thousands of mechanical applications both on the civilian and war fronts . . . and as an aid to greater safety and efficiency on the production lines . . . leather is one material that stands head and shoulders above any other. It has an unusual combination of qualities which make it tougher, more resilient, stronger and more pliable. It will carry on, giving longer, more economical and satisfactory service, where other materials might fail.

But—to bring out the very best in leather, the experience, ability and integrity of the manufacturer is most important. Our 65-year reputation for creating products of dependable quality, for special and standard use, is well known.



Chrome leather tool bag used for small hand tools in aircraft assembly. Resistant to abrasive wear.

Chicago Rawhide Products on the production lines—



Electric drill holder, stitched and riveted for extra strength. Used in aircraft production.



Non-sparking cup used in powder plants for mixing explosives. Has wedge shaped bottom.

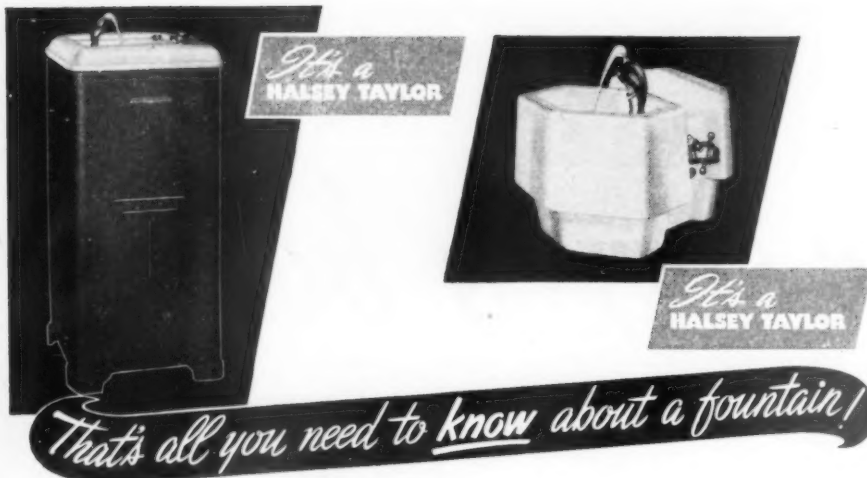
Manufacturers of Leather and Synthetic Rubber Products for Mechanical Application

CHICAGO RAWHIDE MANUFACTURING CO.

Established 1878

1301 ELSTON AVENUE, CHICAGO, ILLINOIS

DETROIT • NEW YORK • PHILADELPHIA • LOS ANGELES • PITTSBURGH • BOSTON • PEORIA • SYRACUSE • CLEVELAND • CINCINNATI



Whether it's a cooler, or a pedestal or wall fountain, if it's a Halsey Taylor it's the fixture best adapted to plant installations. Patented features promote sanitation and the vitally necessary freedom from contamination that means so much to the health and satisfaction of the worker. The Halsey Taylor line is complete, providing types for office or shop, each the acme of enduring, trouble-proof service!

THE HALSEY W. TAYLOR CO., WARREN, OHIO

HALSEY TAYLOR
Drinking Fountains



THE STEEL WAREHOUSEMAN:



There are a lot of conflicting ideas about the function of a steel warehouseman. Some warehousemen believe their job is done if they stock a variety of steels and offer good delivery. We at the Bissett Steel Company have a somewhat different opinion of our position in industry. Every one of our key men is schooled in metallurgy, prepared to analyse your needs and make expert recommendations.

FOR IMMEDIATE DELIVERY

N. E. Steels and Standard S.A.E. Steels, both Carbon and Alloy, Hot Rolled and Cold Drawn — Chisel Steels — Cumberland Ground Shafts — Drill Rod — High Speed Steels — Shim Steels — Tool Steels — Tool Steel Tubing — Boiler Tubing.

★ ★ BUY WAR BONDS ★ ★

the BISSETT steel company
DIRECT. MILL REPRESENTATIVES SINCE 1920

MAIN OFFICE & WAREHOUSE
947 E. 67TH ST. • CLEVELAND
TELEPHONE HENDERSON 0995

NOTICE:
LATEST N.E. STEEL DATA
NOW READY; SEND FOR
FREE COPY.

(Continued from page 166)

cellulose acetate molding powder under special allocation order. M-396-b.

Essential Activities — War Manpower Com.—Revised list of essential activities was recently released by WMC. All changes up to and including January 15 are included. This is first complete list published since December, 1942.

Gray Castings Pricing — OPA — Six changes in provisions governing maximum prices for gray iron castings, designed to strengthen and clarify ceilings and aid in their enforcement, have been announced by OPA. MPR 244.

Aluminum Control Modified — WPB — Rules governing maintenance repair and operating supplies (MRO) under CMP have been modified to make it possible for persons desiring to purchase aluminum for MRO purposes to obtain it in the same manner that steel and copper in controlled materials forms and shapes are obtained, WPB Controlled Materials Plan Division announces. (CMP Reg. 5, as amended.)

Work Glove Control—OPA—Thirty additional types of staple work gloves have been placed under specific dollars and cents ceiling prices and several revisions have been made in work glove regulation, OPA announces. Regulation controls prices at manufacturing level. Amend. 2 to MPR-506.

Lumber Procedure Simplified—WPB — Restricted southern pine lumber and restricted hardwood lumber may be obtained through certification instead of through specific WPB authorization of purchase orders when needed for authorized production of truck and trailer bodies, production and repair of railroad rolling stock and passenger carriers, and production and shipping of steel and other controlled materials, WPB announces. Directions 4 and 5 to M-361 and M-364.

Certain Transformers Freed—WPB—All single phase power and distribution transformers having capacity smaller than 250-kilovolt-amperes (measure of transformer capacity) with few exceptions, have been removed from scheduling and purchase order control, WPB Power Division announces. Table 8 to M-293, as amended.

Sound Equipment Available — WPB — Public address system sound equipment will be made available to limited number of industrial plants engaged in essential war work.

War Contracts Board Organized—War Department—Navy Department—Maritime Commission—Treasury Department—Reconstruction Finance Corporation—War

(Continued on page 170)

MO-MAX

TRADE MARK REG. U.S. PAT. OFF.

HIGH SPEED STEEL



Free Trial Bit AVAILABLE

Users of ground high speed tool bits may now try a **MO-MAX** Bit without cost or obligation. Your "Cleveland" Distributor or your nearest "Cleveland" Twist Drill stockroom will gladly send a Service Representative on request to bring the Bit to you.

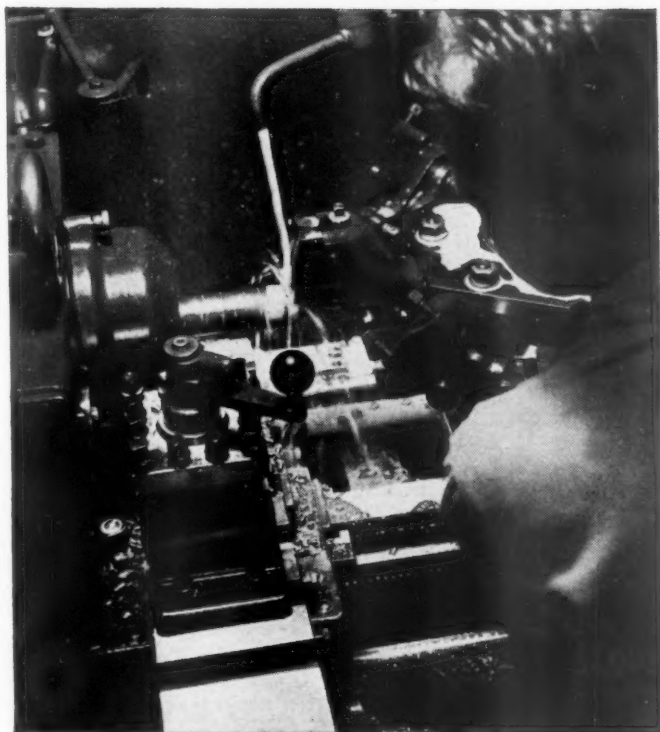
Such trial service in your plant will establish the high cutting-tool effectiveness of **MO-MAX** High Speed Steel which is once again available now that restrictions on its output have been removed. Tests have shown an average of about 20 percent more work per grind per tool than bits made of other high speed steels.

FORMULA FOR GENERAL PURPOSE MO-MAX

| | |
|------------|------|
| Carbon | .80 |
| Molybdenum | 8.50 |
| Tungsten | 1.50 |
| Chromium | 4.00 |
| Vanadium | 1.00 |

MO-MAX High Speed Steel is backed by ten years of successful use, and is established as a standard for quality and quantity production. If your regular steel supplier doesn't have **MO-MAX** High Speed Steel contact any one of the fourteen leading tool steel producers listed below.

Technical data book brought up to date! Send for your copy of this new booklet which has been completely rewritten to explain the application and use of **MO-MAX** High Speed Steel. Address: The Cleveland Twist Drill Co., 1242 East 49th Street, Cleveland 14, Ohio.



THEY'RE ALL MO-MAX

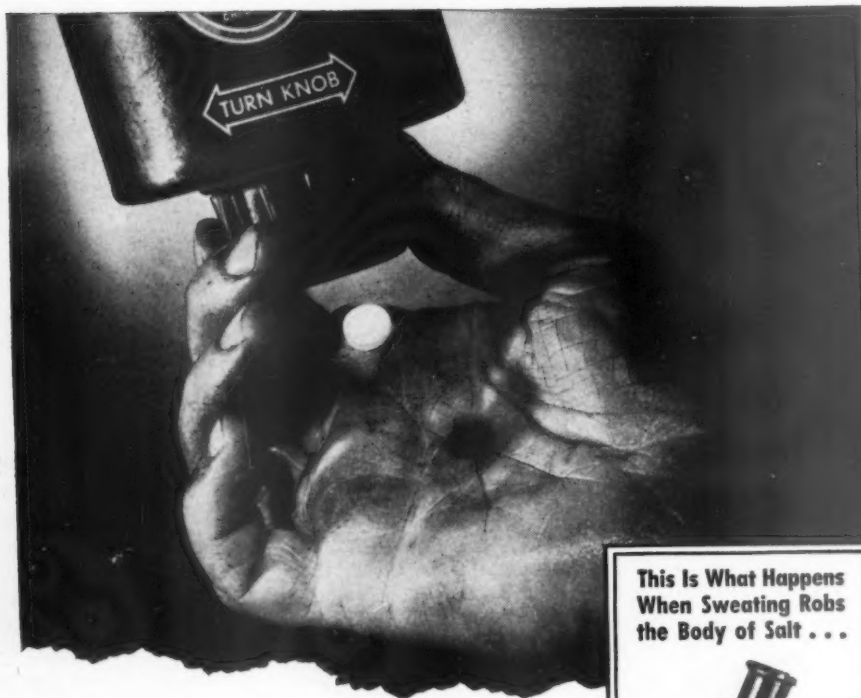
| | |
|----------------|----------------------------|
| "LMW" | Allegheny Ludlum Steel Co. |
| "Mohican" | Atlas Steels, Ltd. |
| "Bethlehem HM" | Bethlehem Steel Company |
| "Mo-Cut" | Braeburn Alloy Steel Corp. |
| "Star Max" | Carpenter Steel Co. |

| | |
|------------|-------------------------------|
| "Molite 8" | Columbia Tool Steel Company |
| "Rex-T-Mo" | Crucible Steel Co. of America |
| "Di-Mol" | Henry Disston & Sons, Inc. |
| "Rex-T-Mo" | Holcomb Steel Co. |
| "Mogul" | Jessop Steel Company |

| | |
|------------|-------------------------------|
| "Tatmo" | Latrobe Electric Steel Co. |
| "S. T. M." | Simonds Saw and Steel Co. |
| "Mo-Tung" | Universal-Cyclops Steel Corp. |
| "Vul-Mo" | Vulcan Crucible Steel Co. |

WORKERS

Need Salt-

Supply it—this easy, simple way for less than 1c a man per week

At hard work on a hot day, a worker can easily throw off several quarts of sweat — sweat that robs his body of vital salt.

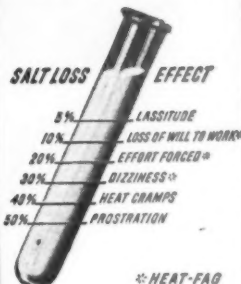
Salt is a balance wheel in the human body. It keeps body fluids in equilibrium and gives tone to the blood. When salt is lost the body is dehydrated and the blood thickens. The result is Heat-Fag, lassitude, inalertness. Production suffers, accidents increase, absenteeism is common.

But loss of body fluids causes thirst. Excess water without salt under these conditions, dilutes body fluids and causes heat cramps.

The easy, simple, sanitary way to replace the salt lost through sweat is with Morton's Salt Tablets. It costs less than a cent a man per week to have Morton's Salt Tablets available at every drinking fountain.

Physicians with America's largest manufacturing plants have the figures to show that this cuts down Heat-Fag, heat cramps, heat prostrations. Production stays up. Accidents stay down.

**This Is What Happens
When Sweating Robs
the Body of Salt . . .**



QUICK DISSOLVING (Less than 30 Seconds)

This is how a Morton Salt Tablet looks when magnified. See how soft and porous it is inside. When swallowed with a drink of water, it dissolves in less than 30 seconds.

Case of 9000, 10-grain salt tablets . . . **\$2.60**
Salt-Dextrose tablets, case of 9000 . . . **\$3.15**

MORTON'S DISPENSERS

They deliver salt tablets, one at a time, quickly, cleanly—no waste. Sanitary, easily filled, durable.
800 Tablet size . . . **\$3.25**

Order from your distributor or directly from this advertisement . . . Write for free folder.



MORTON SALT COMPANY, Chicago 4, Ill.

(Continued from page 168)

Contracts Price Adjustment Board, created by renegotiation section of Revenue Act of 1943, established.

Priorities Revision Issued—WPB—The issuance of the bi-monthly revision of Priorities Regulation No. 3, making changes in (1) the list of items which may be delivered without regard to preference rating and (2) the list of items for the purchase of which blanket maintenance, repair and operating supplies (MRO) preference ratings may not be used, is announced by the War Production Board.

Purchase Order Freeze Clarified—WPB—Purchase orders which have been frozen under the provisions of Priorities Regulation No. 18, remain frozen in the delivery sequence that is established for them regardless of the fact that general Schedule Order M-293 has been modified.

Solvents Order Revoked—WPB—Because carbon tetrachloride, trichlorethylene and perchlorethylene, three chemicals chiefly involved, have now been placed under allocation orders M-371 and M-363, General Preference Order M-41 governing chlorinated hydrocarbon solvents has been revoked.

Estimated Glass Container Output—WPB—Estimated 1944 production of glass containers of 98,000,000 gross and estimated requirements for year are about 95,500,000 gross, according to data presented at recent meeting of the WPB Glass Container Manufacturers Industry Advisory Committee. Requirements are based on quotas established for various uses by Order L-103-b.

Containerboard Control Tightened—WPB—Critical shortage of containerboard has made it necessary for WPB to assume complete control over distribution of all containerboard. To accomplish this, amendment to Conservation Order M-290 has been issued.

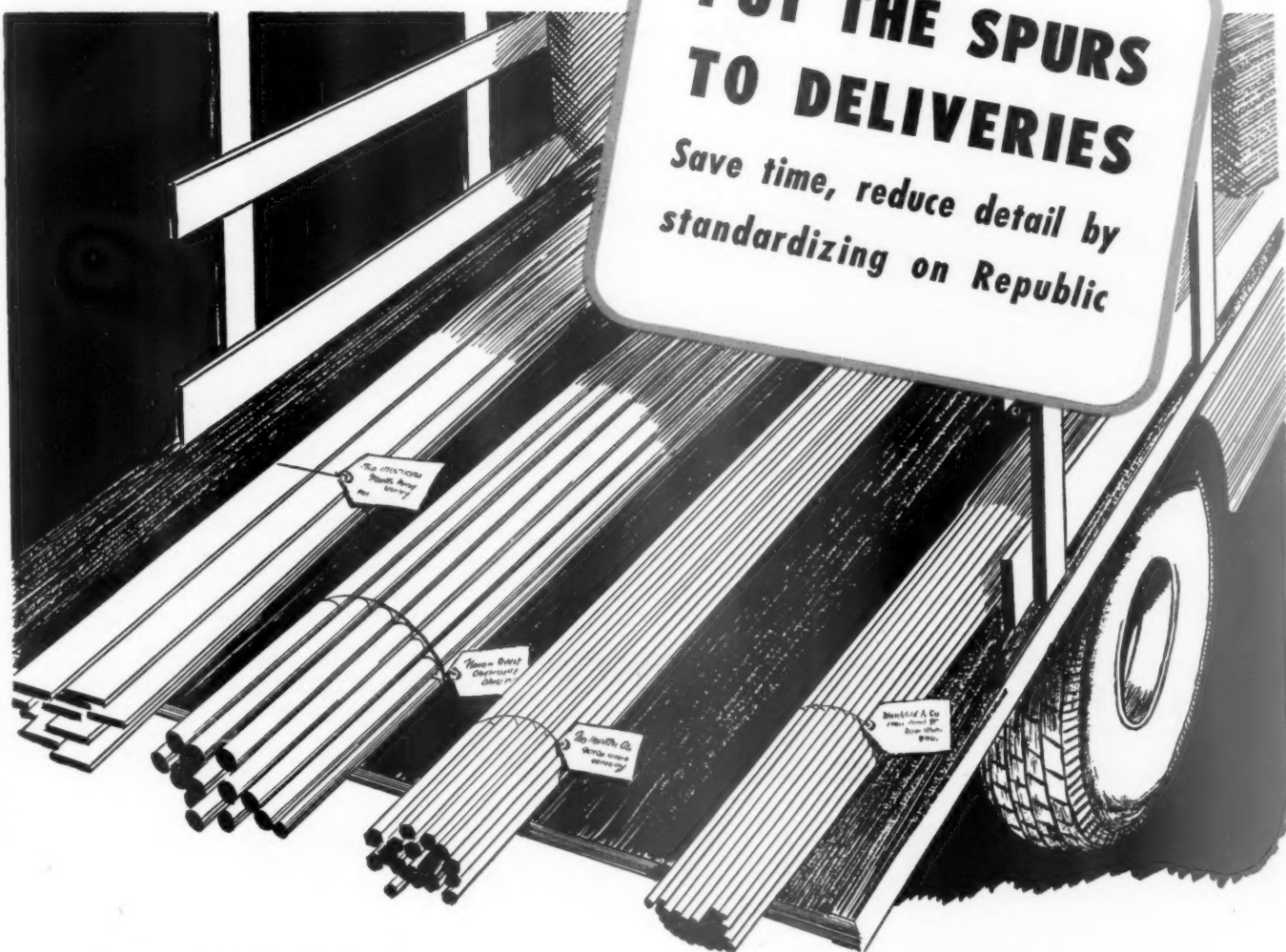
Packaging Machinery Rule changed—WPB—Control over purchase and use of packaging and labeling machinery has been removed from provisions of Limitation Order L-83 since control over this type of equipment is now covered by new Limitation Order L-332.

Blow Torch Situation Tight—WPB—Military requirements for blow torches are being met but production is not sufficient to take care of essential civilian needs.

Scheduling Interpretation Revoked—WPB—Interpretation 1 to General Scheduling Order M-293, which clarified application of Class Z product delivery date control procedure, has been revoked. Class Z product procedure, which was designed to assure realistic delivery requirement statements by users of certain critical components and parts, has been eliminated from General Scheduling Order

(Continued on page 172)

**PUT THE SPURS
TO DELIVERIES**
Save time, reduce detail by
standardizing on Republic



Full war output for Final Victory depends upon keeping production machines going. And that depends a lot upon your responsibility to have the right materials on hand when needed. So, weigh the advantages of the Republic Steel Products Line in helping you speed deliveries.

If you want to reduce detail work, speed up the placing of orders, save time in locating sources, minimize the bother of checking many suppliers, you can do it all with *one dependable source* for many materials—Republic.

The Republic Line includes carbon, alloy and stainless steels—Bessemer, open-hearth and electric furnace steels—hot rolled and cold drawn bars—flat rolled products—

semi-finished and finished steel items—pipe and tubular goods—bolts, nuts, wire and fencing—steel building materials—to mention only a few.

When you buy Republic, the vast resources and experience of a leading steel producer and fabricator are available to you. They can be extremely helpful in selecting the right material and in determining the best way to work it.

So, when the pressure is on you for faster deliveries, remember the Republic Line can help you in a lot of ways. There's a bookful of them—Book No. 199-A. It's a 20-page directory of Republic products, and it's yours for the asking.


REPUBLIC STEEL CORPORATION

General Offices: Cleveland 1, Ohio

Berger Manufacturing Division • Culvert Division
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Union Drawn Steel Division • Truscon Steel Company
Export Department: Chrysler Building, New York 17, N. Y.

Republic **STEELS**
AND STEEL PRODUCTS





"COIL SPRING" says:
I CAN TAKE IT!
I'M MADE BY
THE U. S. STEEL WIRE
SPRING CO.

The ability to take the stresses and strains of present-day, high-speed production is an essential with us in all the springs we produce. Operating efficiency lasts only as long as the parts, from which the piece is made, hold up. Let the spring break, lose resiliency or become weak; then efficiency is lost. We've built our business on the premise that quality can never be sacrificed nor service curtailed. For that reason we are adding many new names to our customer list.

EXTENSION COMPRESSION
TORSION FLATS
WIRE FORMS

THE U. S. STEEL WIRE SPRING CO.

7800 FINNEY AVE. • MICHIGAN 6318 • CLEVELAND



HYSTER WINCHES multiply tractor usefulness

Around industrial plants, a "Caterpillar" tractor equipped with a HYSTER winch saves time and manpower doing such jobs as car spotting, hoisting materials and equipment in plant construction, moving tools or other heavy equipment in inaccessible places, moving and erecting tanks, installing transformers and innumerable other jobs.

A "Caterpillar" is far more useful when HYSTER equipped.

HYSTER equipment for "Caterpillar" tractors is sold and serviced by "Caterpillar" dealers everywhere . . . See your nearest dealer for information.



FACTORIES
2978 N. E. Clackamas Street
PORTLAND 8, OREGON
★
1878 North Adams Street
PEORIA 1, ILLINOIS

(Continued from page 170)

under February 10 amendment which became effective March 1, 1944. As a result, Interpretation 1 to that order is no longer applicable.

Idle Material Rule Broadened—WPB—Rules governing special sales of idle and excess materials, as spelled out in Priorities Regulation 13, have been broadened to include finished products as well as industrial materials to which they formerly applied.

Alcohol Situation Improves—WPB—Slight improvement in Nation's alcohol situation is reported. However, situation is still so difficult that resumption of beverage alcohol production cannot possibly be considered at present time.

CLASS Z PRODUCTS—INT. 1 TO GSO M-293 REVOKED

Interpretation No. 1 to General Scheduling Order M-293, which clarified application of the Class Z product delivery date control procedure, has been revoked, the War Production Board announces.

The Class Z product procedure, which was designed to assure realistic delivery requirement statements by users of certain critical components and parts, has been eliminated from the General Scheduling Order under the February 10 amendment which became effective March 1, 1944. As a result, Interpretation No. 1 to that order is no longer applicable, and has been revoked.

INTERPRETATION COVERS HOT-ROLLED CARBON STEEL BARS

The War Production Board recently issued Interpretation 1 to Schedule 15 of Limitation Order L-211, as amended, clarifying certain questions that have arisen concerning hot-rolled carbon steel bars.

The interpretation explains that the term "hot-rolled carbon steel bars" as used in the order does not include carbon file-steel bars or wrought iron bars. It also makes clear that the restrictions of the schedule apply generally to production and delivery—not to use.

There are also two other technical explanations in the interpretation regarding dimensions and designations.

CHEMICAL PRODUCTION, CONSUMPTION AND STOCKS

Facts for Industry, Series 6-1-1, issued by the U. S. Department of Commerce, Bureau of the Census, reports United States Production, Consumption and Stocks of Chemicals 1941-1943. Inquiries regarding the report should be sent to the Bureau of the Census, Washington 25, D. C.

WOVEN TEXTILE FABRICS

Commercial Standard CS59-44, Textiles—Testing and Reporting, is now available from National Bureau of Standards, Washington 25, D. C., in mimeograph form.

INDUSTRY'S TOOLS OF WAR



WRENCHES by BILLINGS

Wrenches have always been the production tools of Industry. Today, they are Industry's Tools of War!

The assembly of war and fighting equipment moves faster with Billings Wrenches in the hands of the men who "know how".

It's our job to produce these Tools of War for Industry at "top" capacity. We're doing it!

Billings

YOU CAN RELY
ON BILLINGS TOOLS

FORGED TOOLS

THE BILLINGS & SPENCER CO., HARTFORD 6, CONN., U.S.A.

Among the ASSOCIATIONS

PURCHASING AGENTS "ARE IN THE WAR"

**Public Printer Giegengack Tells Washington Association
Emphasizes Responsibility of P.A. in War Effort**

"The men and women who go to market and buy the things that keep the wheels of government, industry and commerce turning are in the war as much as the soldiers at the front," declared A. E. Giegengack, Public Printer of the United States, at the March meeting of the Purchasing Agents Association of Washington, D. C.

"Your efforts may count just as heavily in the final decision," he continued. "I know that we regard purchasing as a function on which all of our operations at the Government Printing Office may succeed or fail. And I know, too, that if we fail, it may cost us men's lives. I know this because the War and Navy Departments tell us almost daily that delay of their printing means that an invasion will have to wait, that a division's supplies will be held up, that planes and guns are worthless without the training manual or the instruction chart.

"In other words, all of us are fighting this war for survival and none of us may desert our post or our efforts without danger to our cause. Your government or your company, as the case may be, has put you in a position of trust and responsibility where you must do your best. America has too much at stake for you or me to do less."

7700 Employees

Mr. Giegengack said that his office performs practically every operation connected with all known methods and processes of printing and lithography, with the exception of rotogravure work. At present the department employs about 7,700 employees, and the printing office building contains 33 acres of floor space. During 1943 the produce of the Office was valued at approximately \$78,000,000 about \$60,000,000 of which represented the value of materials which went into the product or money expended through the Purchasing Division for commercial procurement.

"All of you are familiar with market conditions today," said Mr. Giegengack. "You know that it is extremely difficult to keep a plant the size of the Government Printing Office stocked with everything that is needed to meet the every demand made upon it by all of the governmental agencies.

"Our Purchasing Division proper has 50 employees. The 325 employees of the Stores Section, which is under the su-

pervision of the Director of Purchases, receive and issue all stocks.

"In the latter part of 1943 when production was at its peak, we were using approximately 1,500,000 pounds of paper every day. This is 30 carloads of 50,000 lbs. each. Such production required the purchase of approximately 40,000,000 pounds of all grades of paper per year. This is 200,000 tons or 8,000 carloads. Our estimated requirements



A. E. Giegengack, Public Printer, who addressed Washington Association

for the second quarter, April 1 to June 30, 1944, is 60,000,000 pounds."

Mr. Giegengack explained that all of this paper is not used in the Washington office. The average use there is nine carloads daily. The rest is used on contracts with printing houses "located in every part of the United States."

Impact of Changes

"Life in the Purchasing Division is not made easier by the application of priorities and the limitations on grades, weights, sizes and quality of nearly everything we buy. On the one hand, we have the Navy, for example, saying that paper for charts must be waterproof and of a certain weight. On the other hand is the War Production Board, limiting or forbidding its manufacture until the request is considered from the standpoint of essentiality. We have just had the experience of preparing and printing paper specifications, estimating quantities needed for the fourth quarter of the fiscal year, and three hours later having a number of our most commonly

(Continued on page 178)

A PROGRAM YOU CAN'T AFFORD TO MISS SCHEDULED FOR NATIONAL CONVENTION IN MAY

This year, as last, the convention is going to be based, almost exclusively, on the program. In fact, we can repeat the promise, made then and kept: "There will be no entertainment; but there will be stellar attractions—on the program. There will be no high-pressure promotion of attendance; but there will be a program that no purchasing executive who must solve today's problems in buying can afford to stay away from."

Yes, "today's problems in buying" are the very same words—but how different the problems are now! That's why you must come again. And, if you were not fortunate enough to attend last year's convention, you know from what you heard from those who did, that you don't want to miss this one.

All Practical Material

Speakers who have a real message for purchasing agents. Men whose opinions you'll want to hear first hand. Forums on practical purchasing subjects; committee and group sessions that provide the answers to your questions through spirited discussion, and the opportunity to ask "the fellow who knows" (there's always one who can tell you) how he solved a problem that's troubling you.

Although many nonmembers will want to attend our convention sessions, the first choice of available facilities will be for N.A.P.A. members. The plan, adopted for the first time last year, of requiring that a convention registration be made in order to secure a hotel reservation at the headquarters hotel worked out very well. It will be followed again this year.

There will be no blocs of hotel rooms held for anybody. Don't ask for them, please. Anybody who is sure enough of attending the convention to make a hotel reservation is sure enough to send in his convention registration first.

The 1944 Convention Committee

1 1 1

SAYS "GAS" WILL REMAIN SCARCE

Robert E. Shillady, General Purchasing Agent for the New England Power Association, Boston, declared that gasoline was going to be "tight" this summer, at a meeting of the New England Purchasing Agents Association March 13th. He based his assertion on a tremendous demand for high octane gasoline for war purposes this spring, and stated that the new catalytic process for making high octane gas would take most of the regular gasoline off the market.

The First Word
IN CONSTRUCTION

The Last Word
IN WEAR!

There is longer life in "Big Fist" Shovels because they are built—blade, handle, and grip—to cost less in the long run.

Make a note to specify "Big Fist" on your next shovel order and watch your shovel costs go down and down.



**THE STEEL
I-BEAM HANDLE
REINFORCEMENT**

The Steel I-Beam adds a minimum of 30% more strength in the section above the socket where 65% of the handle breaks occur. It gives lightest and strongest handle reinforcement—yet retains all resiliency and flexing ability needed for full efficiency.

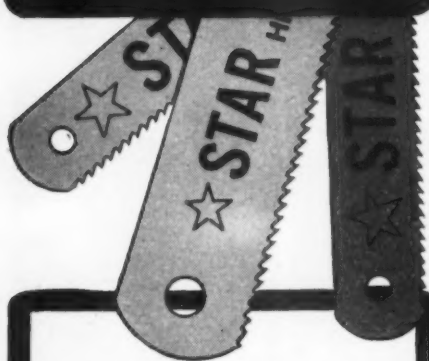


THE

SHOVEL AND TOOL COMPANY • PIQUA, OHIO

A NATIONAL ORGANIZATION SPECIALIZING EXCLUSIVELY IN SHOVELS, SPADES AND SCOOPS

GET THE RIGHT STAR BLADE FOR



Hand Hack Saw Cutting of

| | |
|--------------|------------------|
| ALUMINUM | METAL TRIM |
| BRASS | PIPE TUBING |
| CONDUIT | SHEET METALS |
| COPPER | SOFT STEEL |
| DRILL ROD | STEEL PIPE |
| HARD ALLOYS | THIN TUBING |
| LIGHT ANGLES | THIN METAL WALLS |
| | TOOL STEELS |

Power Hack Saw Cutting of

| | |
|------------------|--------------|
| BRONZE | PIPE |
| CAST IRON | RAILS |
| HARD ALLOYS | SOFT STEEL |
| (Med. Dia.) | TOOL STEEL |
| HARD ALLOYS | (Large Dia.) |
| (Large Dia.) | TOOL STEEL |
| HEAVY ANGLE TRIM | (Med. Dia.) |
| IRON PIPE | TUBING |
| LIGHT ANGLES | WROUGHT IRON |

Band Saw Cutting of

| | |
|-----------------|--------------|
| ALUMINUM | DRILL RODS |
| BRASS SHEETS | IRON SHEETS |
| BUILDER'S BOARD | METAL WOOD |
| CAST IRON | MONEL SHEETS |
| COPPER | PIPE |
| | ZINC |



This metal cutting book tells you the proper selection and use of Hand and Power Hack Saw Blades and Flexible Back Band Saws for the materials you cut. Send for your copy. Clemson Bros., Inc., Middletown, N. Y.

*T. M. Reg.—Blades bearing the name "MOLY" are made only by Clemson Bros., Inc., and affiliated companies.



CLEMSON

Makers of Hand and Power Hack Saw Blades, Frames, Band Saws, and the Clemson D-17 Lawn Machine

ELECTRONICS SUBSTITUTE FOR SENSES

Potentialities of Industrial Electronics Outlined to Members of Eastern New York Association

Electronics has been described as "electricity free from the bondage of wires," W. C. White, engineer in charge of the Electronics Laboratory of the General Electric Company, told members of the Purchasing Agents Association of Eastern New York, for whom General Elec-

this idea a step further, we can imagine the wire of an electrical circuit cut and an electron tube inserted in the gap. This change allows the current in this circuit to be controlled faster, more accurately, and more efficiently than by any other means. During the split second



Members of the Eastern New York Association watch Dr. C. W. Clapp of General Electric demonstrate the magnetic wire recorder. The machine records sound on hair-thin steel wire, and the recording can be played back almost immediately without processing

tric Company recently sponsored an "electronics" night program, at which they were shown industrial uses of electronics and were guests at a special television show. "I think this is a most appropriate phrase," he said. "Carrying

when the electric current is a stream of free electrons leaping across the gap through the vacuum of the tube you can control this current with great speed and accuracy.

(Continued on page 178)

PRESIDENT NEWBERY GUEST OF FORT WAYNE ASSOCIATION

President Ben Newbery of the N. A. P. A. was guest speaker at the February 15 meeting of the Fort Wayne

of Commerce quarters. 100 members and guests attended the meeting.

Mayor H. Beals made an address of welcome, in which he commented upon the problems confronting purchasing agents at present. Ermin Ruf, president



100 Members of the Purchasing Agents Association of Fort Wayne, Ind. and their guests, turn out to greet President Newbery

(Ind.) Association of Purchasing Agents, which was held in the Chamber

of the Chamber of Commerce also ad-
(Continued on page 180)



AVAILABLE ON REQUEST . . . Handsome full-color 10" x 10" reproduction of this dramatic painting of the "Card Gang" by Lt. Commander Anton Otto Fischer, the internationally famous marine painter. No advertising matter.

The Card Gang... Scourge of the U-boats

A squat baby flat top with an unarmored hull . . . three over-age destroyers, class of 1917 . . . that's the famous "Card Gang" that helped clear the U-boats from the North Atlantic last year. Certainly not a formidable looking unit, this . . . but what it lacked in looks it made up in skill and daring . . . when it went into action it hit the enemy with everything but the anchor!

Strafing and bombing the Nazi-underseas craft the Card's aircraft squadrons, aided by the destroyers, earned a Presidential Unit Citation for destroying more submarines than any other team in Naval history. In one three-day battle this Task Unit sank or probably sank six submarines; damaged two others.

The "Card Gang" was in plenty of tight spots . . . lost one escorting destroyer in a terrific encounter with a U-boat pack during which a giant Nazi-undersea maunder was rammed and attacked with bombs, depth charges, machine gun bursts, shell fire, and even shotguns and pistols before it was sunk. But the "Card Gang" won . . . saved all but 27 of the destroyer's crew. Men and women of the Star Electric Motor Company take a special interest in the continued exploits of the Card for three large motor generators of our manufacture are part of its equipment.

STAR ELECTRIC MOTOR COMPANY, Bloomfield, N. J.



**STAR
MOTORS**

**POWER PACKAGED
AS YOU NEED IT**



The Battle-Proven **ELECTRIC WATER COOLERS**

● Since 1942, the entire Cordley output has been required for sea duty on U. S. Navy (Contract NXs 9982) and Maritime Commission ships. Shockproof construction, high overload capacity, sanitary water protection and ratproof cabinets are typical advantages of Cordley Battle-Proven Coolers.

We are now authorized to offer a limited number of Cordley battle-proven models to war plants, hospitals, military bases, etc.

Write for facts



CORDLEY AND HAYES

456 FOURTH AVE., NEW YORK 16, N. Y.

MANUFACTURERS OF DRINKING WATER EQUIPMENT SINCE 1889

PURCHASING AGENTS IN THE WAR

(Continued from page 174)

used stocks reduced as to basic weights.

"Our paper inventory carries about 500 items; our inventory of all other supplies, approximately 22,000 items. Ours is a complete printing plant and the demands of the Composing Division, Platemaking Division, Presswork Division and Bindery Division must be met. For the composing Division we are continually buying monotype, linotype and intertype matrices, magazines and repair parts for our battery of 368 typesetting and casting machines. For the Presswork Division, demand is mostly for replacement parts for the 200 presses."

Since August 1940, when the Office first bought printing from commercial printers, it has placed 18,812 contracts with 1,426 printers in 258 cities, at a total cost of \$46,750,000—this representing the cost of printing only, as all paper and plates were furnished by the Government.

Preceding the dinner meeting, Clifton E. Mack, president of the association, led a forum discussion on "Disposal of War Surpluses." Two new applicants were elected to membership—Arthur B. Lakin, Purchasing Agent, Harry Alexander Co., and E. P. Johnson, Sec. and Manager of Purchases, E. C. Ernst, Inc.

John H. Martin, Chief Implementation Officer, Office of Operations, Vice Chairman, War Production Board, will be the guest speaker at the April meeting.

1 1 1

ELECTRONICS SUBSTITUTE FOR SENSES

(Continued from page 176)

"Electron tubes of varied sorts have found widespread application in industry in a diversity of ways. I believe that back of the technical reasons for their use lies a general idea of which I choose to call 'routine saving.' This may well be compared with the so-called 'labor saving' applications of electricity.

"By 'routine saving' I mean the ability of a piece of equipment to do something that one of the senses plus certain muscles of the body do—without the aid of the thinking brain. For example, a person can watch a production line of manufactured objects pass by and note whether a certain part has been included or properly located. To do this requires looking at the object and, when a difference in appearance is noted, to operate a lever or respond in some other way. This is a job easy to accomplish by means of electronics because a phototube may be substituted for the eye so that a beam of light shining past the object to the phototube is affected when the part in question is missing or improperly placed. When the tube is thus actuated, electrical relays plus solenoids or motors can follow up with the desired action.

"Extending this idea, the electrical microphone will respond to sound and the thermocouple to temperature.

"Other combinations incorporating vacuum tubes can be made to respond to
(Continued on page 180)



POWER UNDER VELVET CONTROL

The brute force of line pressures up to 1500 pounds is harnessed with velvet smoothness by KEROTEST Valves. Easy action, positive closing, long life with minimum wear are Kerotest features . . . at work today for war—ready to serve you after Victory.

KEROTEST MANUFACTURING CO.
PITTSBURGH, PENNA.



HOW AMERICAN INDUSTRY PRODUCES MORE, FASTER,
BETTER WITH BOWSER EXACT LIQUID CONTROL



SAVED—A FLOOD OF PRECIOUS SOLVENT... and costs cut to one-tenth

A small ocean of paint is needed to protect planes and other war goods against rust and corrosion.

A Cleveland paint maker, irked at seeing much precious solvent wasted with dirty paint and residue (reclamation processes then used were prohibitively costly), looked for a practical solution.

A Bowser Still was installed. With it, thousands of gallons of solvents were reclaimed at a cost of only a few cents per gallon, about one-tenth of the old cost. At that rate of saving, the Still paid for itself in its first 150 hours of operation.

Maybe your plant operation doesn't require Stills.

But you do need filters, or lubrication units, or meters... likely several of the many exact liquid control devices made by

Bowser. Here's a quick case history of a Bowser Filter operation:

A manufacturer had grinding wheel trouble... too much glazing from wheel and metal dust; too much expense for dressing, which required too many diamonds. Four remedies were tried. All failed. Then a Bowser Pressure Filter was installed. Results: **1—27% increase in production. 2—80% reduction in wheel dressing; comparable saving in diamond cost. 3—42% reduction in scrap. 4—Greatly improved quality of work.**

And here's an important point to remember—wherever your plant is located, you're close to a complete Bowser service organization. BOWSER, INC., Fort Wayne 5, Ind.

THE NAME THAT MEANS
EXACT CONTROL OF LIQUIDS



BUY
WAR BONDS



(Continued from page 178)

slight changes in the movement of an object. Many of the modern applications of electron tubes in industry are based on this fundamental idea that may be called 'extending the senses.'

"Another aspect of this same idea is in timing a manufacturing operation. Electron tubes can accomplish this and, in applications like resistance welding, control the timing of the circuit accurately to as close as 1/120 of a second or multiples thereof.

"The matter of 'routine saving' is only just starting, and one can think of many cases where it might function to advantage, and probably will, as time goes on."

Speaking of electrical frequencies he said that frequency-modulation broadcasting utilizes frequency in the order of 50 million cycles per second, and on the "horizon using frequencies of about 60 to 100 million cycles is the fascinating field of television.

"Now this is all part of the scientific fundamental that, when you have a new idea, material or device that enables you to do something several to ten times faster, slower, larger, smaller, higher, stronger, lighter, etc., than was done before, scientists and engineers soon put it to work doing new and useful things."

NEWBERY AT FORT WAYNE

(Continued from page 176)

dressed the meeting, followed by National Director Gilbert Nelson who spoke on present market conditions and trends in government control.

Commodity talks, a regular feature of the Fort Wayne meetings, were led by Clark Smith of Allied Mills who summarized the grain situation and emphasized the importance of soy beans to American economy, and R. Fisher of Columbia Woolen Mills. Mr. Fisher reviewed the inconsistencies in the price of wool which has fluctuated 200% to 300%, and summarizing the wool market today warned that such prices would wreak havoc with inventories. He said that American bottoms returning from Australia have filled the American market with cheaper Australian wool. On the other hand, he said, our government has paid the farmers a higher price for their last season's clip, and has upgraded and guessed incorrectly on the percentage of oil content of this wool.

Following a brief talk by Gerald Smith, National vice president, 4th district, President Newbery was introduced. Mr. Newbery reviewed the tasks and responsibilities of Purchasing Agents incident to changing conditions and the winning of the Peace. He stated that in our participation in world affairs we of necessity must buy and sell in foreign markets, but must do so intelligently. "We can be honest," he said. "We can refuse to be led into tricky or expedient ways of doing things that ought to be done only the right way." He said America should not attempt to rehabilitate the entire world through giving

(Continued on page 184)

How to cut **DOWN-TIME** **DOWN!**

through Bronze Repair Welding



119 MAN-HOURS AND "997" ROD RESTORES BIG PRESS TO SERVICE. "Months to replace" was the bad news when this press housing gave way on all-out war work. But 400 lb. of Anaconda "997" (Low Fuming) put it back on the production line.

Time and time again Bronze repair welding has come to the rescue when important production equipment has suddenly failed. Repairs, measured in hours, have saved days, weeks, even months required for replacement. The value of such proved, reliable emergency service is incalculable. As the few case histories shown on these pages indicate, repair welding with Tobin* Bronze, "997" (Low Fuming) and other Anaconda Bronze Welding Rods saves time and expense in putting broken parts back into service . . . no matter how large or how small. Other examples are shown on the following page.

*Trade-Mark Reg U. S. Pat. Off.

THE AMERICAN BRASS COMPANY • General Offices: Waterbury 88, Conn.



Left: SEVERAL BAD BREAKS—This 2½-ton gear, broken in a number of places, looked almost impossible to repair. But Tobin Bronze welding had the gear back in operation—welded, and machined—in less than a week.

Center: "997" REPAIR WELD SAVES MONTH'S LOSS ON A-1-a WAR ORDER. Requiring only 75 lb. of Anaconda "997" (Low Fuming) Rod, this 2-ton section of a 100" boring mill was speedily returned to service.

Right: "TEMPORARY" REPAIR MAKES GOOD—When this 15-ton roll housing broke, two temporary repair welds with Anaconda Bronze were tried. The welders had the mill back in service in nine days. (P. S. After more than two years, this mill with its "temporary" weld, is STILL turning out its daily quota of metal.)

TOBIN BRONZE REG. U. S. PAT. OFF.

ANACONDA 997 (LOW FUMING)



Anaconda Bronze Welding Rods

EXPERIENCED MAINTENANCE MEN SAY:

**"DON'T SCRAP IT...
WELD IT!"**



Even with a bad break like that illustrated at the left, Bronze welding proved its merit. 35 hours for chipping and preheating, 165 pounds of Anaconda "997" (Low Fuming) Rod, and 11 hours for welding put this soundly repaired press frame back in operation.

To fully appreciate the time and cost savings made possible through Bronze welding, the following advantages should be kept in mind:

Bronze welding saves preheating and annealing time, oxygen and acetylene.

Lower temperatures reduce the possibility of warping or cracking—many parts can be welded without dismantling the machine.

No serious stresses are set up and parts can be returned to service almost immediately.

Lower temperatures permit fast and economi-

cal joining of intricate sections, parts of cast iron, malleable iron, steel or copper alloys, and of radically different weights or cross section.

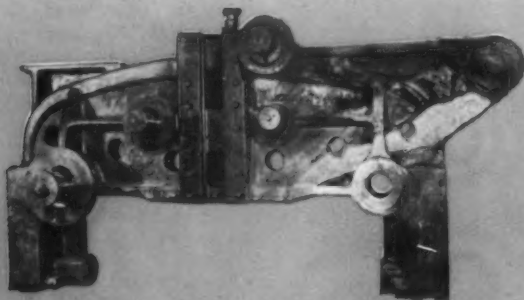
The American Brass Company has pioneered in the development of Bronze welding and has available a wide range of Anaconda Welding Rods—a suitable one for almost every gas or electric Bronze Welding purpose. Anaconda Publication B-13 describes these rods and suggests procedures for their use. A copy is yours for the asking.

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut • Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ontario

44115



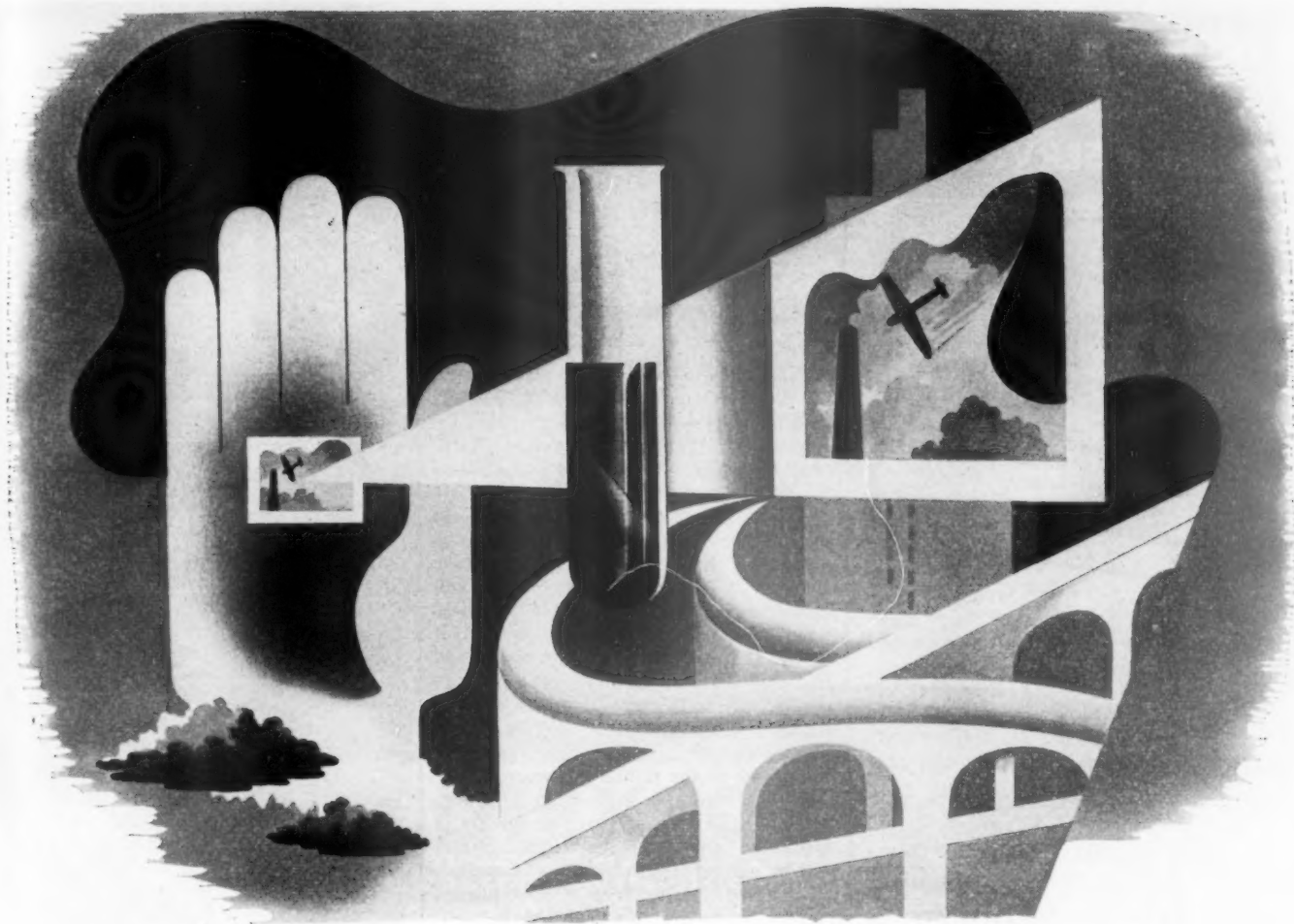
15-TON PRESS CROWN BACK IN ACTION IN A WEEK. Again Tobin Bronze to the rescue—1150 pounds of it—to restore this fractured 15-ton casting. Bearings were in alignment after welding and no machining was necessary.



SERIOUS DELAY AVOIDED IN PRODUCTION OF 75 MM. SHELLS. A seven-foot fracture in this 6-ton press column was repaired in three days; 20 hours preparation, 48 hours welding time, 400 lb. Tobin Bronze Rod.



Anaconda Bronze Welding Rods



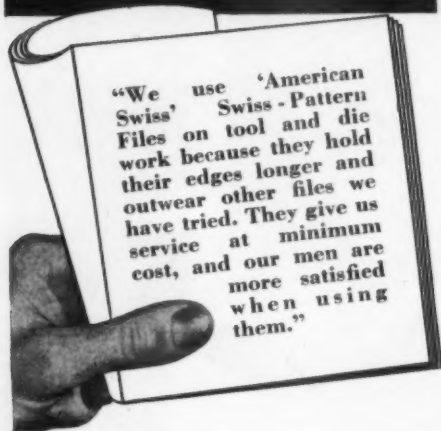
VISIONARY DREAMS

In test tubes fired by war, chemical research has laid the foundation for far-reaching prosperity. New Products have been created, new bases developed, new techniques evolved which stagger the imagination . . . which translate today's dream into tomorrow's demand. How this research will affect your business, what it can do for your product, is obviously im-

possible to ascertain except by expert examination . . . and such examination should certainly be included in your post-war planning. Our staff of expert finishing engineers will be glad to cooperate. Your inquiry incurs no obligation. Address The Stanley Chemical Company . . . manufacturers of Stanley Lacquers, Synthetics, Enamels, and Japans . . . East Berlin, Connecticut.

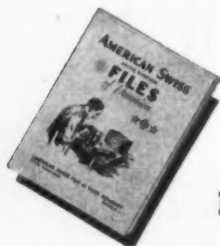
Stanley Chemical

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AMERICAN SWISS FILE & TOOL CO.

ELIZABETH

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BY THIS NAME

American Swiss

SWISS PATTERN FILES

(Continued from page 180)

away the bounty and energy of Americans. He pointed out that the normal supply of materials after the war will be augmented by the tremendous surpluses on hand when the war is over, many of which will be adaptable to peace-time use and peace-time manufacture.

1 1 1

SAYS CIVILIAN ECONOMY BEACHHEAD MUST BE ESTABLISHED

Executive Secretary George Renard of the National Association was the principal speaker at a meeting of the Purchasing Agents Association of Western Massachusetts held in the Hotel Kimball, Springfield, February 17. He declared that some of the talk about war psychology should be forgotten and industry placed in the position of looking ahead to the civilian economy which will follow the war when returning soldiers will want jobs. "We are capable of facing the facts of life," he said, "and chief among them is that industry must be looking ahead even while it is fully engaged in war production. Civilian economy must be prepared to establish a beachhead in the military economy. The end of the war is definite and certain, he said. The area of peace constantly is spreading, and soon the United States will be getting most of the raw materials of which it was deprived at the outbreak of the war such as tin and rubber.

"It is now known that all-out war production is providing too much of almost everything, except possibly aircraft and even that shortage will be overcome this year with 120,000 airplanes to be produced. Thus it is not too much to ask now that materials and labor not needed for continued all-out war work be made for essential civilian purposes.

"Not only must the war be won, but the peace as well and one of the strongest factors in retaining that peace will be a strong domestic economy which will be capable of handling the employment problem that will result after the fighting is over."

He counseled that Purchasing Agents look into their inventories and stocks and to watch out that they are not in a position to be caught by falling prices. He stated that materials accounting is to stay as part of the procurement procedure and that the controlled materials plan will outlast the war, declaring that the old hit-or-miss methods are gone forever.

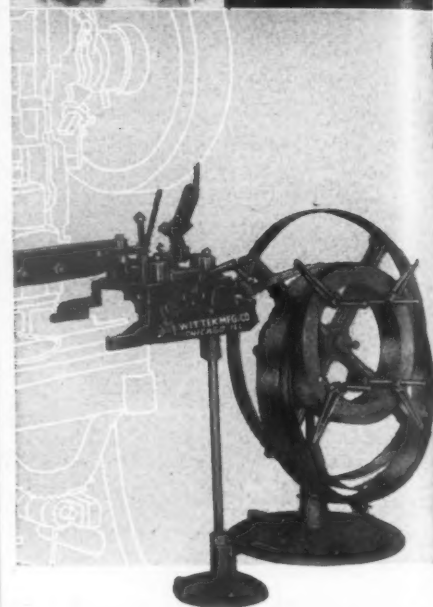
1 1 1

PROGRESS IN AERONAUTICS N.W. PA. ASSN.

Samuel J. Irvine, vice president and general manager of the Aero Supply & Manufacturing Corp., Corry, Pa., spoke on "Progress in Aeronautics" at the March 2nd meeting of the Northwestern Pennsylvania Purchasing Agents Assn.,

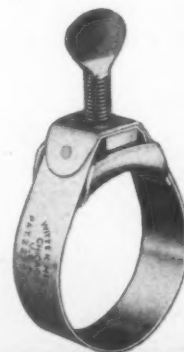
(Continued on page 186)

**Our Punch Presses
Are More Flexible
And Productive
With WITTEK
Automatic Roll
Feeds And Reel
Stands**



Manufacturers of metal stampings facing problems in the feeding of coiled strip stock to punch presses will find that Wittek Automatic Roll Feeds and Reel Stands conserve man-hours and achieve new high production levels.

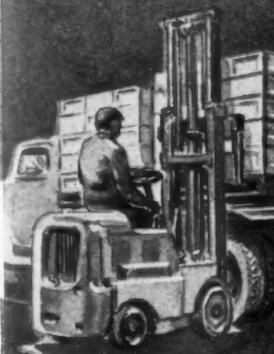
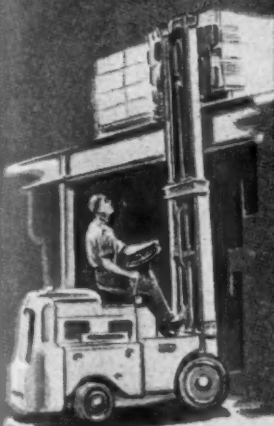
Providing an improved and simplified method of punch press operation, Wittek Automatic Roll Feeds and Reel Stands insure rapid, safe and accurate feeding under all conditions. Made in four different types to meet all automatic feeding requirements. Write for complete details. Wittek Manufacturing Co., 4305-15 West 24th Place, Chicago, Ill.



Wittek Hose Clamps for over twenty years identified with the Automotive and Aviation industries, are noted for their permanent leakproof hose connections. For original equipment and replacement.



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CLARKTOR-6 INDUSTRIAL TOWING TRACTOR

The BIG job today and always is faster movement of materials. Delays in transportation cannot be tolerated.

Factories, warehouses, railway terminals and air ports are the hot spots where materials hit the bottleneck.

"Clarktor-6" towing tractors quickly relieve congestion in these areas. They tow loads up to 85 tons and prove their staying qualities on the job 24 hours every day.

They're built like a battleship and powered by gas for continuous service.



Clark Tractor builds industrial haulage vehicles for every material handling operation.

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The EUTECTIC Welder
MARCH 1944
Volume 1, No. 3

TOUGH CAST IRON WELDING PROBLEMS SOLVED

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NEW WELDING PUBLICATION

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- ★ Cost Analysis
- ★ Welding Design
- ★ Production Ideas
- ★ Salvaging Tools
- ★ New Maintenance Economies
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For WELDERS • ENGINEERS

... Created to disseminate factual information and knowledge gained from the experience of successful users of EUTECTIC Low Temperature Welding, the new welding process which is gaining wide acceptance in production, salvage and maintenance. All metals from aluminum to zinc die-castings can be joined by this process. Applicable with oxy-acetylene torch, metallic-arc, induction and furnace heating.

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Welders, welding engineers, and metallurgists have acclaimed the arrival of The EUTECTIC WELDER. An engineer writes:

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Name.....

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Address..... City.....

(Continued from page 184)

held in the Hotel Corry in Corry. Commodity discussions were led by Arthur W. Clinger for the Oil Buyers Group, D. F. Malone, Jr. on "Steel," and Lester M. Danner on "Priority Trends."

1 1 1

"FOOTBALL PARTY" AT COLUMBUS

The Columbus (Ohio) Association of Purchasing Agents held its annual football party in the Southern Hotel, March 1, with Coach Paul Brown of Ohio State University as the speaker. Motion pictures were shown of the Purdue, Illinois and Indiana games.

1 1 1

DAVIDSON HEADS CALIFORNIA MUNICIPAL PURCHASING AGENTS

Harry L. Davidson, Berkeley, Calif., was elected president, and Charles C. Harvey, Pasadena, first vice president of the California State County and Municipal Purchasing Agents Association, which recently concluded its annual convention at Long Beach. Lowell R. Smith, Sacramento, was elected second vice president, and Berne O. Gehringer, San Diego, secretary-treasurer. Sacramento was selected as the 1945 convention city.

1 1 1

ROCHESTER ASSOCIATION SPONSORS CONTAINER SALVAGE PROGRAM

Under the leadership of President W. A. Charity, the Rochester Association of Purchasing Agents, in collaboration with the Container Division of the War Production Board, sponsored a container salvage and re-use program March 1, which was attended by some 350 representatives of industry in the Rochester area. The purpose of the meeting was to acquaint buyers and management executives with the serious situation that prevails in the wooden and fibre package fields, and metal, textile and glass. The meeting was described by WPB officials as being highly successful, and one of the best of its kind held so far since the container re-use movement was inaugurated last October.

John A. Warren, representing the WPB Containers Division, said that in 1943 the packaging industry consumed approximately 5% of the steel, 50% of the wood, and 55% of the paper produced in this country, for the manufacture of containers, declaring that in 1944 our consumption of paper and wood would be even larger.

In 1941, industry produced 18,000,000 high test steel drums. In 1943, it produced 28,000,000. Prior to the war, the fibre can industry was a comparatively small one which manufactured about 3,000,000 containers in 1941, largely for dry products having no hygroscopic or grease penetration characteristics. By 1943, this industry has been expanded to production level of 7,500,000,000 containers, many of which were of the liquid and grease types. In 1941 the glass

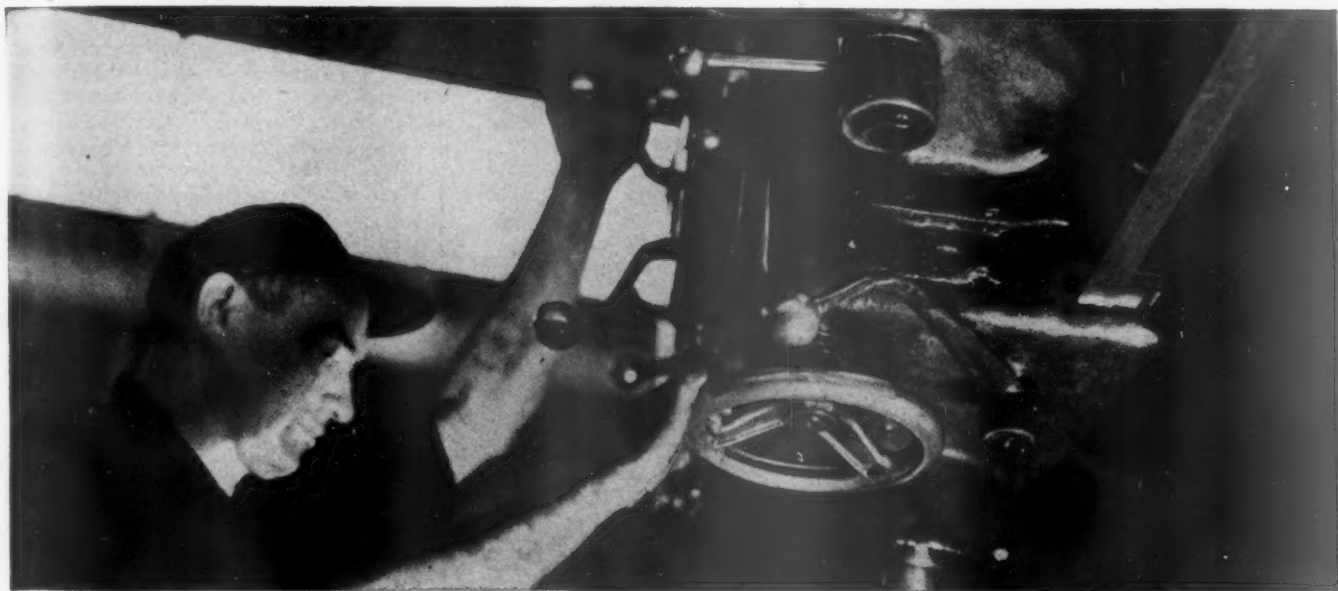
(Continued on page 188)

Why is Jones better than Smith?

ON YOUR POSTWAR PAYROLL will be two men—let's call them Tom Jones and Fred Smith. They will do identical work. They will receive identical pay. Yet Jones will be better than Smith—produce better, faster, at lower cost. Why?

Because Smith is "weather-sensitive". Summer heat and humidity slow him up. Industry knows the answer—and so do you. It's comfort air conditioning—and the figures are available on what it promises for lower postwar costs.

Don't dismiss it as a fad. Your competitors aren't. Talk to the man in your town who is ready to help you plan for it now.



HOW YOUR LIGHTING COMPANY CAN HELP YOU CUT POSTWAR COSTS

Right in your city is an engineer-representative of your local utility who has the facts on comfort air conditioning . . . who can help you plan now to make all your employees produce to Tom Jones' level!

Postwar employee relations as well as postwar profits hang in the balance! For air conditioning can influence both—and it is not too early today to find out what it can do for your particular plant—and get it on paper!

Of course your electric company has something to sell. And so has Roebling. When the day comes that electric power takes over the job of filling your plant with year-round, high-efficiency climate, remember Roebling as *wire specialists* who are a logical source of supply for the wires and cables modernization will call for. For air conditioning. Better lighting. Better power distribution to your plant's work. Full utilization of all of the electric and electronic cost-cutters the war has evolved.

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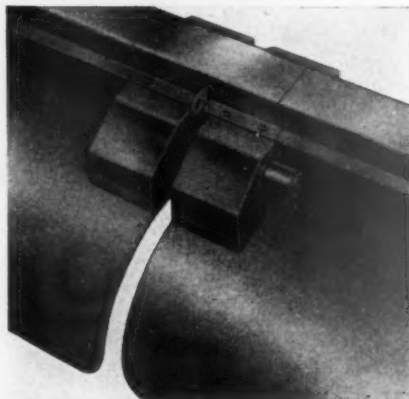


From end to end, Wheeler Reflectors are engineered with all the skill and experience of Wheeler's 62 years' specialization in lighting. They're "skilled lighting" that insures maximum lighting efficiency, durability, and convenience of installation and maintenance.

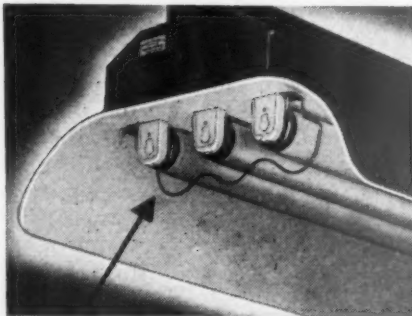
Examine a Wheeler Fluorescent Fixture, for example. Compare its high rigidity, obtained in spite of WPB metal-restriction, by Wheeler's I-beam wiring channel construction. Notice that wiring is *completely metal-enclosed*, yet instantly accessible. Also note the accessibility of starter switches; the speedy adaptability of the unit to continuous runs; and the ample provision of knock-outs for any type of mounting.

Whether you need fluorescent or incandescent fixtures, specify Wheeler and you'll get such "skilled lighting"! Wheeler Reflector Co., 275 Congress St., Boston 10, Mass.... New York City. Representatives in principal cities.

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Simpler Wheeler coupling speedily adapts single units to continuous runs. Note I-beam wiring channel design and accessible starter switches.



Another Wheeler improvement! New Lamp Retaining Guard for modern fluorescent fixtures. Provides new safety... positively prevents falling lamps.

Wheeler REFLECTOR COMPANY

Lighting Equipment Specialists Since 1881

(Continued from page 186)

industry produced approximately 71,000,000 gross containers of all types, and in 1943 it produced 92,500,000 gross with approximately the same facilities. Prior to the war about 5,000,000 fibre drums were produced per year, and in 1943 the production increased to 16,500,000 containers many of which were for packing liquid and semi-liquid products.

Mr. Warren stated that it may be necessary to introduce further restrictions in the use of wooden and paperboard containers to bring supply and demand into balance. "I find there is a great deal of misunderstanding as to what the easing steel situation actually means in container production," he continued. "Our bottleneck is primarily rolling capacity because of the fact that metal containers are all made from flat strip or sheet. Until such time as the war demand for rolled plate products eases, I do not believe we can hope for a substantial increase in the availability of metal for containers.

"The darkest picture we have before us is in the supply of wood and paperboard. In the case of wood, it is estimated that 1944 production will amount to approximately 6 billion board feet less than in 1943. At the same time inventories are down to approximately 7.5 billion board feet, which is practically the irreducible minimum. In 1943 we met requirements partially by withdrawals from inventory. This will not be possible in 1944, and yet we must somehow find 2 billion more board feet of wood for container manufacture than we used in 1943. The wood container picture is very dark, although the tight cooerage situation is reasonably good.

"The paperboard situation is not encouraging. A great deal depends on the success of the southern pulpwood cutting campaign, and of equal importance is the success of the wastepaper campaign."

1 1 1

GEORGE RENARD SPEAKS AT BETHLEHEM

"Watch Surplus Materials," was the keynote of talk by Executive Secretary George Renard of the National Association, at the charter night celebration of the Purchasing Agents Association of the Lehigh Valley held in the Elks Club, Bethlehem. He declared that there is now surplus material in many fields and said that if it is not handled properly it will force a downward trend in prices, the bottom will fall out of the market and there will be another depression. He pointed out what could be done now and until the end of the war in distribution of surplus materials and gradual reconversion of plants to civilian needs, to avoid an after-the-war slump in production and employment.

The meeting was attended by some 135 members and former members who joined in the charter celebration held in honor of past presidents and charter members. P. J. Malloy of Bethlehem was chairman.

(Continued on page 190)



ALABAMA

Birmingham—McConnell Sales & Engineering Corp.

CALIFORNIA

Los Angeles—E. M. Ornitz
San Francisco—W. S. Wetenhall Co.

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Denver—Mine & Smelter Supply Co.

DISTRICT OF COLUMBIA

Washington—Meleney Engineering Co.

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Indianapolis—Hugh J. Baker & Co.
South Bend—Edwards Iron Works, Inc.

IOWA

Des Moines—Delevan Engineering Co.

LOUISIANA

New Orleans—Arthur C. Hays

MARYLAND

Baltimore—H. T. Potts Co.

MASSACHUSETTS

Boston—Brown-Wales Co.
Holyoke—Massachusetts Supply Corp.

MICHIGAN

Detroit—Wm. P. Favorite

MINNESOTA

St. Paul—Robert J. Wylie

MISSOURI

Kansas City—W. R. Fithian
St. Louis—Rhodes Equipment Co.

NEW JERSEY

Essex Fells—Paul G. Koch

NEW YORK

Albany—Edwin D. Shultz
Buffalo—Reecon Company, Inc.
Syracuse—George Rees

OHIO

Cincinnati—Wyman Engineering
Cleveland—H. W. Kaiser Co.
Columbus—F. L. Purdy Co.
Toledo—George J. Haase

OKLAHOMA

Tulsa—Frick-Reid Supply Corp.

PENNSYLVANIA

Altoona—Altoona Pipe & Steel Supply Co.
Philadelphia—H. T. Potts Company

SOUTH CAROLINA

Greenville—Edward McCrady

TENNESSEE

Bristol—J. G. Tilley
Memphis—Pidgeon-Thomas Iron Works

TEXAS

Houston—James A. Hall

UTAH

Salt Lake City—Harrison & Co.

VIRGINIA

Richmond—W. H. Trausneck
Roanoke—Milliken Co.

WASHINGTON

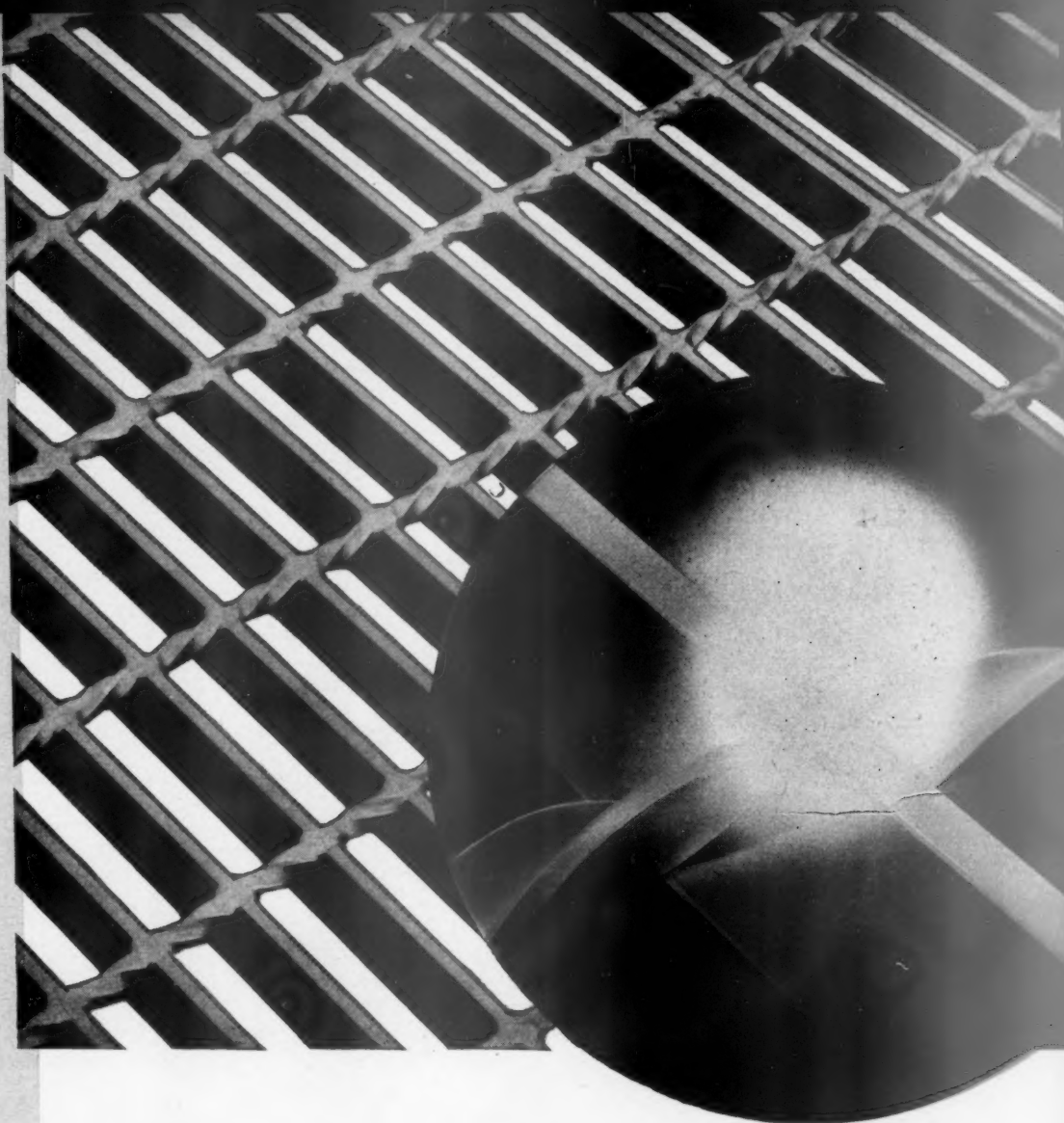
Seattle—Geo. Montgomery

WEST VIRGINIA

Charleston—Fireproof Products Co.
Clarksburg—A. H. McMunn
Fairmont—Fairmont Mining Mach. Co.

WISCONSIN

Milwaukee—Hunter Tractor & Machinery Co.



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WATER ANYWHERE...

Made Safe TO DRINK!

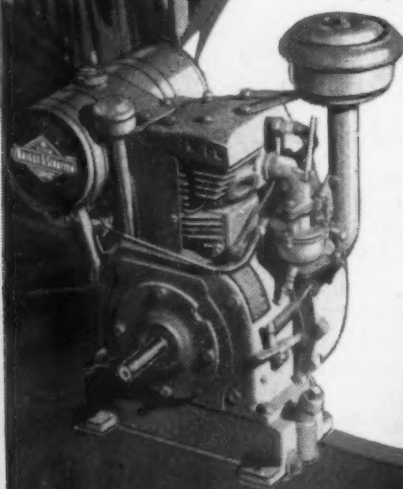
In steaming jungles or sun-parched desert lands, combat engineers must be able to distribute safe, potable water the same day fighting forces "take over." For this purpose portable purification units are used, their pumps powered by gasoline engines. Another of the many vital services by hundreds of thousands of rugged, dependable Briggs & Stratton engines now on duty with our armed forces.

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BUY WAR BONDS
FOR VICTORY!



(Continued from page 188)

of the meeting. He introduced various of the past presidents, who made brief talks on the growth of the local and national associations. H. M. Smith of Allentown, first president of the local group, told of its formation and early history. B. C. Sawyer of Bethlehem, a past president and past national vice president gave a sketch of the national association, and O. L. Lear of Allentown recounted the more recent history of the local association.

Other past presidents in attendance were Mr. Malloy, J. N. Noll now of Westfield, N. J., R. W. Foltz, F. W. Remig, G. L. Baumgartner, R. C. Schaeffer, H. R. Chidsey, G. M. Overfield, and J. A. Nork. G. A. Hildenberger of Bethlehem, a former president, who planned to take part in the celebration, was taken ill while vacationing in Florida and is hospitalized there.

Escapades of the "Hades Auxiliary," a group of non-members who regularly attend open meetings of the association, lightened the serious nature of the meeting, which was also featured by music and group singing.

President Robert T. McClarin presided at the business section. Two new members were presented, viz: Peter Yeisley of the Nazareth Tool and Supply Co., Nazareth, Pa., and Leon Easom of the General Aniline and Film Corporation, Easton.

1 1 1

ROCHESTER INDUSTRIAL BUYERS SELECT NOMINEES FOR NEW YEAR

The following slate of nominees for the new year was presented by Harold Day, chairman of the nominating committee of the Rochester Association of Industrial Buyers at the March 8 meeting of that body held in the Chamber of Commerce.

President, R. Welch, Bausch & Lomb; C. Lechner, Richardson Corporation;

Vice President, L. Harradine, Camera Works; M. Maier, Kodak Park;

Secretary, H. W. Russell, Hawk Eye Works;

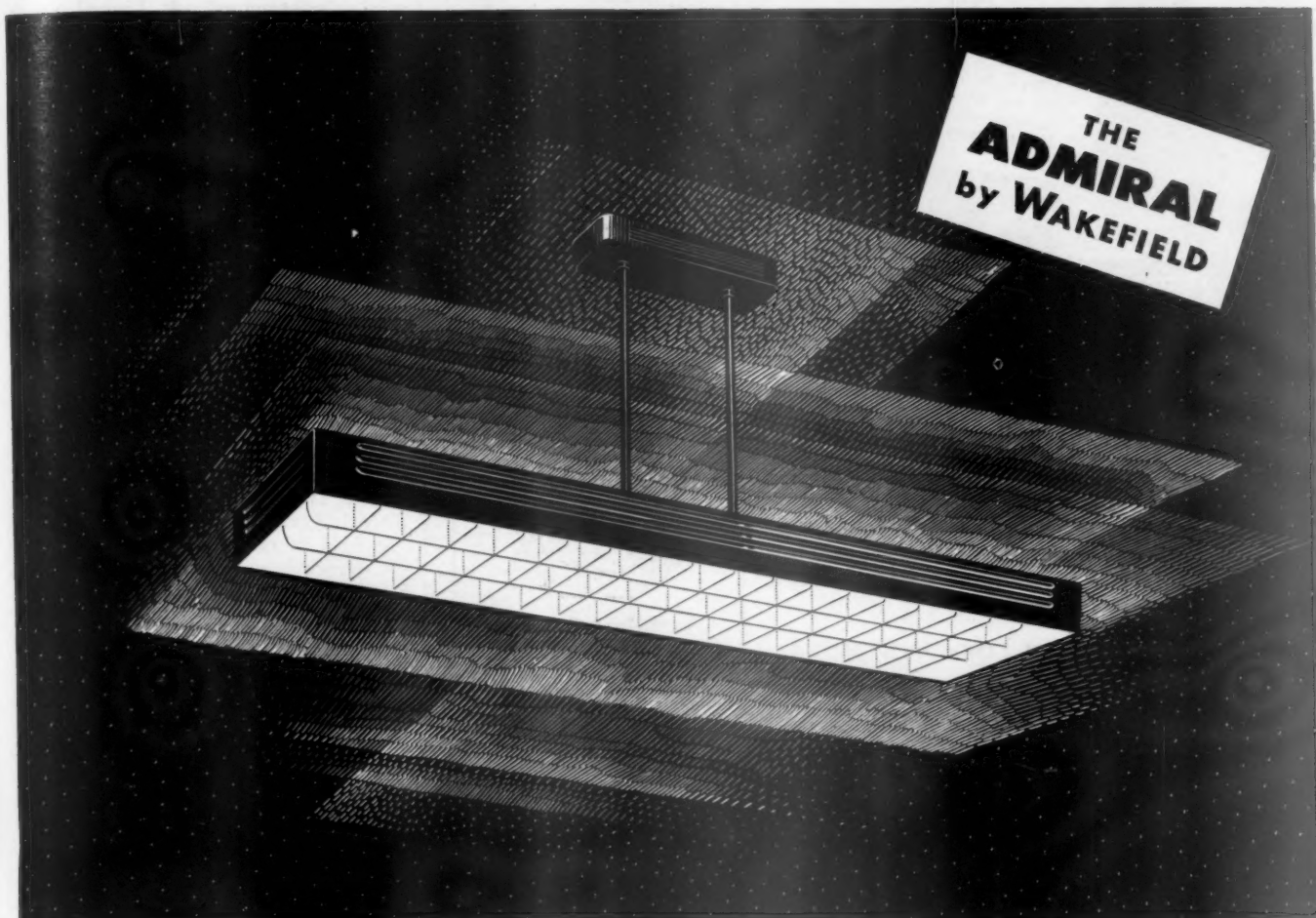
Treasurer, M. J. Kuebel, Taylor Instrument Co.

Directors, (2 to be selected): H. Day, Bausch & Lomb; E. Galen, Kodak Park; J. Harper, Camera Works; J. Mutch, Schelter Last Works; and H. Colwell, Distillation products. Officers are to be elected at the April meeting.

D. A. Gaudion of the Eastman Kodak Company was the guest speaker for the evening, his subject being "Termination Procedure." He stated that termination can be considered a form of industrial demobilization. Most manufacturers have received at least one termination, which in itself can help each firm to set up the termination organization that all will require when the war is won and mass termination affects all. Mr. Gaudion said that at present two-thirds of all production is engaged directly in war work and this percentage will remain fairly constant until the war ends and all con-

(Continued on page 192)

For lighting war plant OFFICE or DRAFTING ROOM



EFFECTIVE ... EFFICIENT ... ATTRACTIVE!

PLEASING to look at, "tops" to see by, and built for service . . . that's the ADMIRAL! It is a natural for lighting the essential office or drafting room. Tell your customers!

Made largely from wood, the ADMIRAL conserves war material and meets WPB limitations on use of metal. At the same time, it provides efficient, high intensity, diffused fluorescent light to help handle wartime paper work faster, with less eyestrain.

The ADMIRAL puts 90% of its light down on desk tops or boards and al-

lows the rest to go upward to avoid ceiling contrasts. This makes it especially effective for work that involves critical seeing or for relighting older office space which has poor ceilings. Walnut finish outside, white enamel inside. Comes in 2, 3 and 4-lamp units. Write us for details that will help you serve your customers.



HELP PREVENT INDUSTRIAL ACCIDENTS . . . GUARD MOVING PARTS . . . HAVE GOOD LIGHT . . . BE ALERT.



THE F. W. Wakefield BRASS COMPANY

RED SPOT LIGHTING FOR WAR PRODUCTION . . . FOR PEACETIME FUTURE

VERMILION, OHIO



One of R. H. Macy & Company's great fleet of trucks. Boots Nuts were tested on trucks like this.

THE above is convincing proof that Boots All-Metal, Self-Locking Nuts can save thousands of dollars—wherever vibration loosens ordinary fastenings.

Boots Nuts will materially reduce maintenance costs by eliminating periodic tightening check-ups.

Boots are one-piece, all-metal, hence unaffected by the corrosive action of oil, water and chemicals. They can be used again and again without the accelerated locking loss of other nuts.

BOOTS SELF-LOCKING NUTS

"There's No Excuse for a Nut Shaking Loose"

Boots Aircraft Nut Corp. • General Offices, New Canaan, Conn.

The ALL-METAL lock is built in here



ROL-TOP. This nut, for the duration used exclusively on all types of aircraft engines, is the type of Boots All-Metal, Self-Locking Nut mentioned in the above statement.

(Continued from page 190)
tracts are completely terminated.

The elements of termination outlined by Mr. Gaudion were as follows: (1) Disposal of physical inventories. (2) Securing of necessary money to get into peace production. (3) Settling claims with subcontractors. (4) Litigation with subcontractors on costs. To assist in the termination procedure, the War Department has issued Procurement Regulation P.R. 15. The speaker said that there are two methods of termination,—Formula, and Negotiation. The former entails a complete audit by the Government and results in loss of time and effort, he declared, and if contract termination can be settled by the latter method, much is to be gained. The speaker also discussed partial determinations, claims and how they should be handled.

BETTER BUSINESS BUREAU SPEAKER AT BALTIMORE

Dwight Holmes of the Better Business Bureau, was the principal speaker at the March 11 meeting of the Purchasing Agents Association of Baltimore, which was held in the Lord Baltimore Hotel, his subject being "Gentlemen Who Live By Their Wits."

SPRINGFIELD GROUP MAKES SUBSTANTIAL RED CROSS PLEDGES

The Springfield Ohio Branch of the National Association of Purchasing Agents, held its regular monthly meeting at the Shawnee Hotel, March 9th. The work of the Red Cross and the Red Cross Service Council was discussed, resulting in substantial pledges being made for both activities. The attention of the membership was called to Senate Bill #702, whose author is Senator Kilgore of West Virginia. This was characterized as a plan to socialize engineering of all kinds and laboratory work, and was said to be associated with patent legislation. It was the feeling that the proposed legislation is of prime interest to companies doing experimental or development work.

National Director Eugene Saum will be unable to attend the forthcoming National Convention in New York City, and B. F. Downey was appointed alternate.

BUYER-SELLER RELATIONS AT CINCINNATI

The third annual joint meeting of the Cincinnati Association of Purchasing agents and The Cincinnati Sales Executive Council was held in Hotel Gibson, Tuesday, March 14. A panel of three members from each group, headed by a speaker, discussed the subject "My Interpretation of the Relationship which Should Exist Between the Buyer and the Seller." Each speaker presented his views on the subject, and the meeting was then thrown open to a general discussion under guidance of the panel mem-

(Continued on page 194)

PLASTIC NAME PLATES
DIAL-FACES
CHARTS, SCALES
CALCULATORS
Patent Notices
Instruction Plates
Markers, etc., etc.

LAMINATED
for Permanence
SAMPLES AND ESTIMATES
CHEERFULLY SUPPLIED
Dept. NP
HOPP PRESS
INCORPORATED
460 W. 34th Street
New York, N. Y.

**"DIE-LESS"
DUPLICATING
SAVES MAN POWER
AND DELAYS!
DIE ACCURACY
WITHOUT DIES
Send for
CATALOG**

BENDER
SHEAR
BRAKE

O'NEIL-IRWIN MFG. Co.
305 EIGHTH AVE. SO., MINNEAPOLIS, MINN.

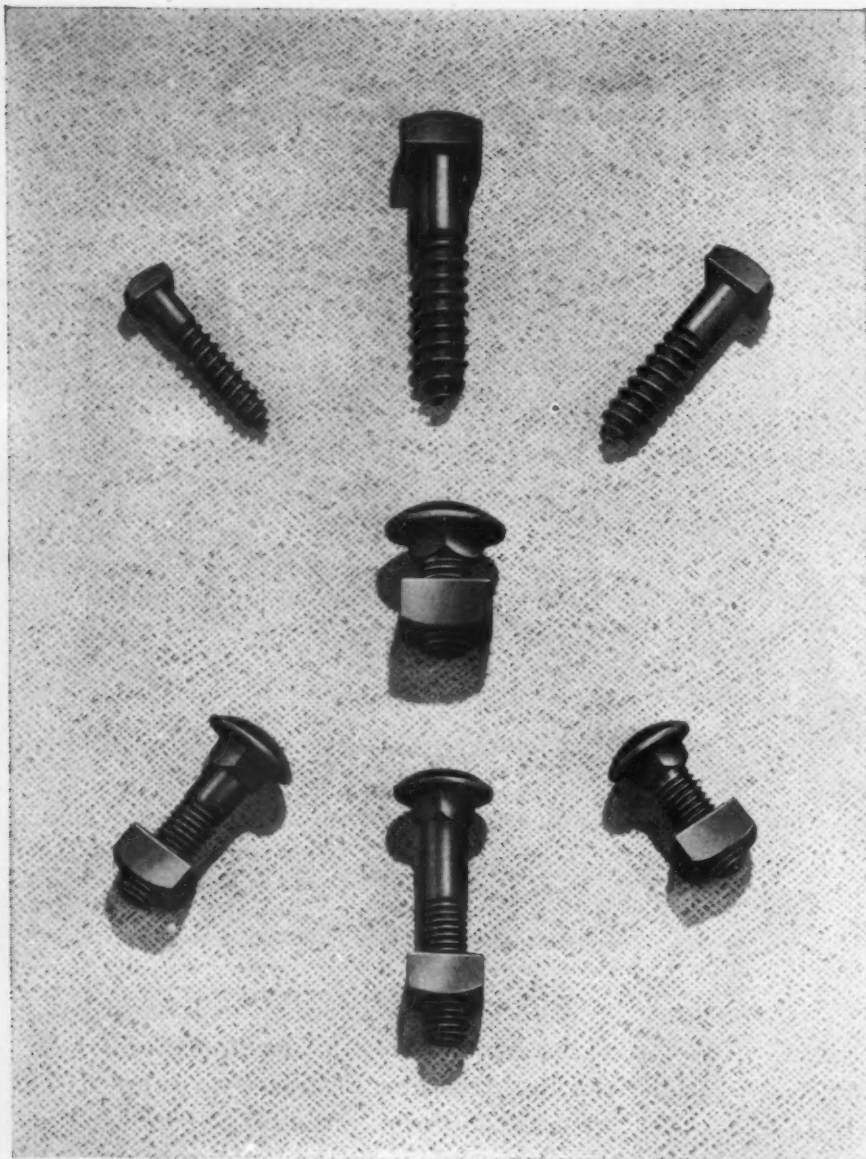
Power and Prestige...

BUILDERS
Shunt **METER**

With the War Production Award of the Army-Navy "E" behind them, the Builders Iron Foundry has contributed to the expansion of power facilities with such outstanding products as the Shunt Meter pictured above against the flags which fly from its plant in Providence, R. I.

The Builders Iron Foundry uses the famous Mason MAILMASTERS for efficiently sending replacement bearing assemblies and repair parts. For efficient — safer — packaging Mason MAILMASTERS will add power and prestige to your mailing and assembly work.

THE MASON BOX CO.
ATTLEBORO FALLS, MASS.
175 5TH AVE.
NEW YORK



LAG SCREWS AND CARRIAGE BOLTS

TRIPLEX Lag Screws and Carriage Bolts are known for their rugged dependability. Seldom do they yield from even excess overload.

It is better to have a Carriage Bolt just a little tougher than necessary for the purpose.

Likewise, with Lag Screws, it is safer to have a little excess of the holding strength normally needed. For if one in a hundred fails, it casts doubt on the other 99.

Specify **TRIPLEX** for that added margin in toughness and dependability.

TRIPLEX SCREW COMPANY

5331 GRANT AVENUE • CLEVELAND 5, OHIO

TRIPLEX THREADED
FASTENERS
CAP AND SET SCREWS • BOLTS, NUTS AND RIVETS

(Continued from page 192)

bers in further development of his ideas. The Purchasing Agents' panel consisted of Robert C. Wheelbarger, speaker, Schauer Machine Co., and Evan T. Davies, Stacey Bros. Gas Construction Co., and Arthur W. Wheeler, The Wadsworth Electric Manufacturing Co. The panel representing the Sales Executive Council consisted of Jerome H. Bell, speaker, Director of Sales, Kelley-Koett Manufacturing Co., and Bob Dickson, Sales Manager, Knight Products, Inc., and Charles H. Maudsley, division manager, Lever Brothers Co.

1 1 1

NEW ENGLAND ENTERTAINS NATIONAL OFFICERS

Ben R. Newbery, president of the National Association, and Robert C. Swanton, vice president of District No. 9, were guest speakers at the March 13 meeting of the New England Purchasing Agents Association, which was held in Schraffts, Boston. Applications of four new members were accepted at the meeting.

Messrs. Newbery and Swanton also were guest speakers at the March 14 meeting of the Rhode Island Purchasing Agents Association, which was held in Narragansett Hotel, Providence, R. I.

1 1 1

PRESIDENT NEWBERY ON WEST COAST

President Ben R. Newbery of the National Association will follow the following itinerary on a swing through the West:

Vancouver, B. C., Monday, April 17.
Seattle, Wash., April 18.
Portland, Ore., April 19.
San Francisco, April 21.
Los Angeles, April 24.
Salt Lake City, April 26.

1 1 1

SEATTLE PURCHASING AGENTS HAVE VARIED PROGRAM

Industrial, commercial and governmental purchasing men from various points in Western Washington gathered at the Washington Athletic Club in Seattle, Thursday evening, March 9, for the monthly dinner meeting of the Purchasing Agents Association of Washington. President Charles V. Tinker was chairman of the evening.

Featured on the program arranged by Vice President D. P. Brewer were:

1. Hector Escobosa, General Manager, Frederick & Nelson, and member of Post War Planning Executive Committee, Seattle Chamber of Commerce, who spoke on "Practical Post War Planning."

2. Ray J. Larrabee, Field Engineer, Underwriter's Laboratories, Inc., who demonstrated the "Fundamentals of Fire Extinguishing."

3. R. Guy Frederick, chairman of the Association's Discussions Committee, presented H. M. Lane, P. A., Pan American Airways, Inc., who spoke on "Problems Facing the Air Line Purchasing Agent."

Preceding the evening meeting, a Pri-
(Continued on page 198)

SPEEDING

V-DAY



From butadiene comes the fighting rubber for the battle fronts . . . the cushions for the wheels of industry. In plants like these, devoted to the manufacture of butadiene, Ladish forged steel flanges are doing their part in the development of synthetic rubber—speeding the day of victory.



TO MARK PROGRESS

FITTINGS DIVISION

LADISH DROP FORGE CO.

CUDAHY • WISCONSIN
MILWAUKEE SUBURB



Thor

● Thor Portable Electric Tools combine compact power with light weight to do scores of jobs faster.

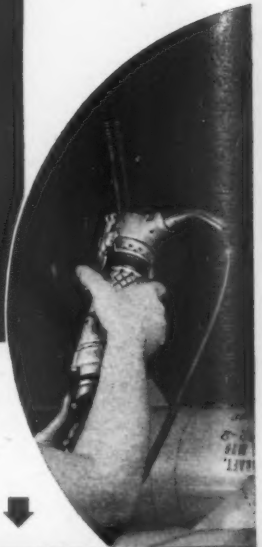
For example—Thor reduced the weight of ¼-inch electric drills 14 percent with plastic housings.

Thor increased the power of electric hammers with a patented "sling-shot" drive.

Thor introduced compact power with the original, close-coupled half-inch electric drill.

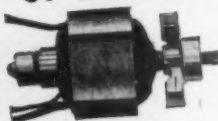
The features of greater power with easier handling combine to give you more efficient performance with Thor Portable Electric Tools for all types of light and heavy duty drilling, screwdriving, reaming, nut setting, tapping, grinding, sanding, polishing, sawing, metal cutting and hammering.

STAR DRILLING like this is fast and sure with the Thor Portable Electric Hammer—for drilling and hammering in stone, wood or metal.



SANDING and finishing preparatory to painting, with an easy-handling Thor Electric Sander, perfectly balanced for efficient operation.

OUTSTANDING THOR FEATURES OF DESIGN AND CONSTRUCTION



Thor Motor



Thor Gears



Thor Bearings

THOR MOTORS

are fabricated of the highest grade materials, with armatures carefully wound and insulated to withstand heat and vibration. Commutators are assembled with special care to avoid floating segments or raised bars.

THOR GEARS

are made of heat treated alloy steel with oversize pitch to assure smooth operation and longer life.

THOR VENTILATION

of the tangential type provides 25% greater cooling capacity.

THOR BEARINGS

of the highest grade, are mounted in cast-in steel inserts and diamond bored to assure perfect alignment.

NEW HELP FOR YOU IN SELECTING ELECTRIC TOOLS



Just off the press, the latest edition of Thor Portable Electric Tool Catalog is packed full of information on the selection of proper tools for your work. 64 pages of complete specifica-

tions, performance data, construction features... arranged for quick and easy reference and fully illustrated.

PORTABLE ELECTRIC TOOLS

➔ **ASSEMBLING** parachute flares with Thor Portable Electric Screwdrivers, light weight favorites of women operators.



➔ **SETTING NUTS** with a large capacity, heavy duty Thor Electric Nut Setter, easy to handle... insuring quick, certain operation.



➔ **GRINDING** down a weld with a Thor Portable Electric Grinder saves handling time by bringing the tool to the work—instead of the work to the tool.



DRILLING with the Thor original close-coupled half-inch portable electric drill, compactly built for fast work on heavy jobs.



Thor

Portable Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY



600 W. JACKSON BOULEVARD, CHICAGO, ILL.

Branches in Principal Cities

PATRONIZE YOUR DISTRIBUTOR

Thor Portable Electric Tools are stocked and sold by leading electrical, automotive, mill supply, plumbing and hardware distributors throughout the world. This guarantees you quick, convenient, reliable service. Write for name of distributor nearest you.

Any Way You Look at it . . .



. . . Arkwright's Tracing Cloths are Tops!

Take Arkwright's MATSURF Pencil Tracing Cloth for example. One draftsman will tell you he likes it because it will take pen or pencil lines with equal

facility . . . because it erases so neatly. Another will say—because it makes such sharp, legible reproductions . . . stands up under rough handling. Try MATSURF yourself. You'll see that it is superior on all counts. Arkwright Finishing Company, Providence, Rhode Island.



Arkwright TRACING CLOTHS

AMERICA'S STANDARD FOR OVER 20 YEARS

(Continued from page 194)

orities Up-to-date Forum was held at 4:30 p. m., with John S. Robinson, Chairman of the Association's Educational Committee, presiding, and Carl C. Nissler, Analyst in the Seattle office of W. P. B. as counselor. Russell Blackburn of W. P. B.'s regional Materials Redistribution Section outlines work under way to move surplus materials in the Pacific Northwest.

1 1 1

MEMPHIS WOMEN P. A.'s VISIT MILL SUPPLIES HOUSE

The avid interest of the Women's Purchasing Agents Club of Memphis, Tenn., to learn more about the products they buy inspired Orgill Bros. Co. to be hosts to the group on February 28, for a lecture program and a personally conducted tour of the six-storied warehouse, followed by a buffet supper. About 30 attended.

Joe Helms, sales manager for Orgill Bros., was chairman of the program and introduced Guy Tucker, manager of the electrical department, who talked on switches and panel boards. Russell Bloodworth, in charge of industrial items, presented the factory representative, J. A. Frizzell, Skilsaw, Inc., Chicago, Ill., who discussed his line. Harold Payne of the tool department talked on saws, hammers, drills and files. A display of the products discussed was on exhibit, and the women entered into a lively discussion following each talk.

K. I. Gary, warehouse superintendent, took the group on a tour of the warehouse, and explained the Pneumatic Tubing System—how an order came in, and the process it went through to the final stages.

Miss Mary Speltz, chairman of the educational program, announced that the group would hold other such meetings during the year, as well as their regular monthly meetings, as it is the objective of the group to become more familiar with the products they buy.

1 1 1

"FRANCE FIGHTS ON" CHICAGO

Count Byron de Prorok, who has led some 18 official expeditions in North Africa in the past twenty years, spoke on the subject "France Fights On" at the March 9 meeting of the Purchasing Agents Association of Chicago, illustrating his talk with a natural color film on the activities of various groups of the Fighting French. He has spent almost all of his mature life in the countries of the Mediterranean basin.

1 1 1

DISCUSS COMMODITIES AND INVENTORIES AT SPRINGFIELD

Commodities, their new relationships and probable changes in available materials during the balance of the war period and the early part of the postwar program, were the basis of discussion at

(Continued on page 200)

It's
A Brute

This
tailor-
made

for
**Strength and
Punishment**

CHESTER CHAIN HOIST

Every individual part
designed and built for
Dependability — to fit
every industrial need.

It's safe —

It's positive in action —

It's rapid —

It's different —

Yet it's priced correctly.

A few distributorships are available.

Made in sizes from $\frac{1}{2}$ to 40 tons and even
larger, when desired. **Timken equipped.**

Used throughout the world by
many branches of our services

Write for Details

CHESTER

MANUFACTURING COMPANY

America's most experienced Chain Hoist
Designer and Manufacturer

LISBON, OHIO

Carey PRODUCTS KEEP 'EM WORKING!

WAR PLANTS • OIL REFINERIES • MILLS
• MINES • TRANSPORT SYSTEMS •
POWER PLANTS • Achieve
Peak Efficiency Through
Proper Maintenance
of Buildings
and Equip-
ment

Industrial management well recognizes the need for proper maintenance of plants and equipment, in order to insure a continuous flow of vital war production.

But with many key men in the armed forces, managers, engineers and executives do not always have the time or help to check and re-check the multitudinous details involved.

Right here, CAREY is performing a vital role. Our nationwide engineering and distribution organization is working hand in hand with plant managers and engineers throughout the country—checking plants and helping to solve problems of efficient, economical repair and maintenance.

And Carey Products, in war plants throughout the nation are right now giving the dependable, long-life service that has made the CAREY name famous for over 70 years.

If you have a problem involving adequate, economical maintenance of plant buildings or equipment, send for book "Proved Protection Against Wasted Profits." Write Dept. 68.

THE PHILIP CAREY MFG. COMPANY, Lockland, Cincinnati, Ohio

Dependable Products Since 1873

Careyduct Air Conveying Systems conserve metals and increase efficiency.

PARTIAL LIST OF

Over 1900 Liberty Ship engines are Carey insulated.

Carey ASPHALT-ASBESTOS-MAGNESIA PRODUCTS IN THE NATION'S SERVICE



Heat insulation saves fuel in power plants.

BUILT-UP ROOFS

AIR-CONVEYING DUCT

WALL BOARD AND SHEATHING

PIPELINE FELT

CORRUGATED ASBESTOS-CEMENT ROOFING & SIDING

ROOF COATINGS

INDUSTRIAL FLOORING

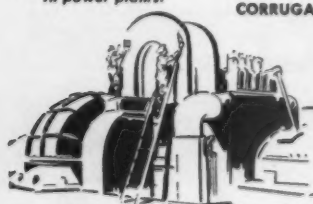
EXPANSION JOINTS

HEAT INSULATIONS

ASBESTOS OIL ABSORBENT



Built-Up Roofs provide weather protection.



Asbestos Pipeline Felt protects "Big Inch" oil line against corrosion.



(Continued from page 198)

the February 23 meeting of the Springfield (Ohio) Association of Purchasing Agents, which was held in the Shawnee Hotel, President Gano presiding. The meeting of March 8 was devoted to a discussion of Community problems.

B. F. Downey of the Yost Superior Co., Springfield, advises that the members have shown a very keen interest in the plan of holding two meetings per month, which is reflected in the higher percentage of attendance.

1 1 1

PRESIDENT TINKER APPOINTS NOMINATING COMMITTEE

President Charles V. Tinker of the Purchasing Agents Association of Washington, Seattle, Wash., has named the following past presidents of the association as a nominating committee to prepare a slate of candidates for association offices for the 1944-5 term: M. F. McClane, chairman; C. G. Holloway, and Karl L. Bates. Election is set for the regular monthly April meeting.

1 1 1

SHOW SUGAR BOWL CLASSIC AT NEW ORLEANS

The Sugar Bowl Classic in technicolor was shown at the March 13 dinner meeting of the Purchasing Agents Association of New Orleans, with narration by Harry Wisner, sports commentator of the Blue Network. Nominating committee, appointed by President Olivier to select candidates for association offices, will report at the April meeting.

1 1 1

WILFRED SYKES SPEAKS AT MILWAUKEE AND ST. LOUIS

Wilfred Sykes, chairman of the National Association of Manufacturers Post War Planning Committee, was the principal speaker at the March 14 Executive Night meeting of the Milwaukee Association of Purchasing Agents. His subject was "Post War Planning."

Mr. Sykes also addressed the Executive Night meeting of the Purchasing Agents Association of St. Louis, held in the Statler Hotel March 21.

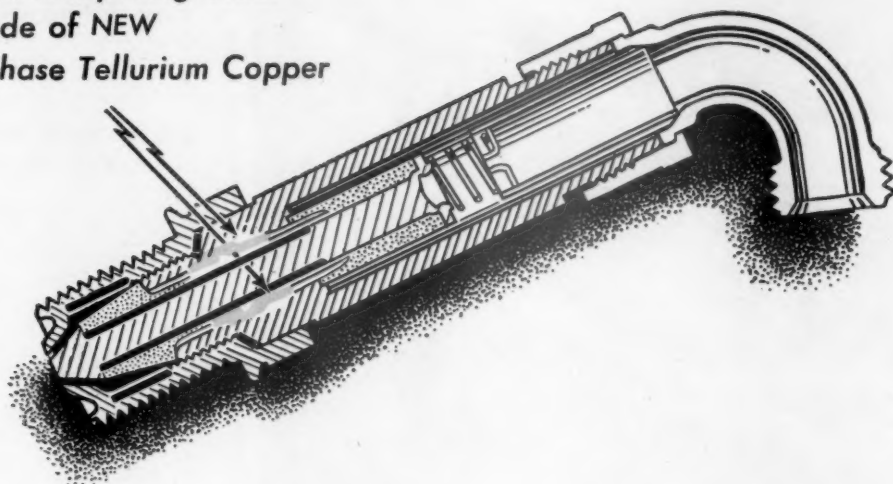
1 1 1

DISCUSS FIRE PROTECTION AT ELMIRA MEETING

Vice President C. Smith of the American-La France Foamite Corp., was the principal speaker at the February 24 meeting of the Purchasing Agents Association of Elmira, N. Y., held in the Mark Twain Hotel. He gave an unusually interesting story of the development of fire protection equipment during the past 100 years, using illustrations of old cuts and more modern equipment to enable his listeners to review with him the past and the present. In the course of his talk it was brought out that the original Button Fire Engine Company manufactured the finest hand pumper

(Continued on page 202)

Heat-dissipating collar
made of NEW
Chase Tellurium Copper



Is there an idea for you in this aircraft spark plug?

If you are looking for a quick, sure way to select the *right* copper alloy for a particular job, there may be a tip for you here . . . whatever your product.

Do you need an alloy with unusual characteristics? You may find it among Chase's newer metallurgical developments. Chase Tellurium Copper, for example, used on the heat-dissipating collars of the Aero spark plug, combines exceptionally high thermal and electrical conductivity with excellent machining and forging characteristics.

Or is your problem largely one of time or cost economies in production? Cones, elbow cush-

ions and shields on the spark plug are made of Chase Free Cutting Brass...long established as the most practical and economical alloy for general-purpose screw machine parts.

In the familiar fields in which there is no substitute for the copper alloys...in the newer applications opened by advances in copper metallurgy...count on Chase copper alloys to meet your needs. More important, count on the copper alloy specialists at the Chase Sales Service Office for assistance in selecting the alloy best suited for the requirements of your specific problem.



CHASE BRASS & COPPER CO.

—Incorporated—
Waterbury, Connecticut

A SUBSIDIARY OF KENNECOTT COPPER CORPORATION

ALBANY†
ATLANTA†
BALTIMORE
BOSTON
CHICAGO

CINCINNATI
CLEVELAND
DETROIT
HOUSTON

INDIANAPOLIS†
KANSAS CITY, MO.†
LOS ANGELES
MILWAUKEE



MINNEAPOLIS
NEWARK
NEW ORLEANS
NEW YORK

PHILADELPHIA
PITTSBURGH
PROVIDENCE
ROCHESTER†

SAN FRANCISCO
SEATTLE
ST. LOUIS
WASHINGTON†

† Indicates Sales Office Only

This is the Chase Network—handiest way to buy brass



**Millionths of an inch accuracy in these
Vital Aircraft Parts is achieved by
Western Automatic on a quantity basis**

● It's no job for amateurs, making these Lycoming R-680 aircraft engine cam followers and cam follower guides of alloy steel. Clearance between walls of follower and guide must be held between .0013 and .0003 inch — and the mating diameters are ground and honed to a 10 micro-inch finish, a mere 10 millionths of an inch! *And they've got to be interchangeable—they're not factory paired.* It pays you to know about Western Automatic's production ingenuity, skilled workmen and vast precision equipment that turn out work like this on a quantity basis for war — and that can do it for your post-war needs after Victory. We may not be able to help you now, but we suggest that you write us for complete facts now.

**Western Automatic
Machine Screw Company**

Elyria, Ohio, U. S. A.

Precision Screw Products, Parts and Assemblies Since 1873

(Continued from page 200)

during Andrew Jackson's second administration, and thence Mr. Smith gave his audience a clear picture of the development of steamers and horse-drawn steamers, to today's modern gasoline driven creations, and the tools, accessories and equipment now in use, and the effectiveness of modern liquids and gases.

1 1 1

**LOS ANGELES PURCHASING AGENTS
VISIT STAMPING PLANT**

Members of the Purchasing Agents Association of Los Angeles, Calif., had the privilege of making a tour of inspection of the plant of the Norris Stamping & Manufacturing Co., Los Angeles, March 16th. The Norris Company is said to have one of the most up-to-date and finest plants of its kind in the country.

1 1 1

**PRESIDENT NEWBERY SPEAKS
AT KALAMAZOO**

President Ben R. Newbery of the National Association and Gerald R. Smith, Fourth District vice president, were guest speakers at a special dinner meeting of the Kalamazoo Valley Association of Purchasing Agents held at the Columbia Hotel, Kalamazoo, Mich., February 23.

1 1 1

**HOOSIERS DISCUSS TRENDS IN
WASHINGTON**

Harold K. Howe, writer of "Washington Review," a summary of the nation's affairs, was the principal speaker at the March 16 meeting of the Fort Wayne Association of Purchasing Agents. Mr. Howe is associated with the La Salle Steel Company of Chicago, and has been in Washington since 1938. His topic was "Current Developments and Trends in Washington."

1 1 1

**HOUSTON ASSOCIATION INSTALLS
NEW OFFICERS**

The following officers for the current year were installed at a recent meeting of the Purchasing Agents Association of Houston, Texas: President, Charles W. Dabner, Jr.; first vice president, Earl Cobden; second vice president, William R. H. Mau; treasurer, W. J. Peddie; secretary, S. L. Dodson; national director, D. M. Layer, alternate national director, Lee Crawford.

1 1 1

**EGYPTIAN OIL DISCUSSED
AT TULSA**

D. R. Davis, U. S. Rubber Co., Tulsa, Okla., who has spent several years in Egypt for the Texas Company, was the guest speaker at the March 14 meeting of the Purchasing Agents Association of Tulsa, his subject being "Prospecting for Oil in Egypt." He illustrated his talk with color slides of Egyptian oil field and human interest views.



what the clipper's secret means to you-

The Clipper's secret was proper control of air. Schrader equipment and controls give compressed air *power* versatility in industry that urges you to look at air *power* in a new light.

New economy, for example. Schrader Air Ejection Sets apply the principle of controlled, intermittent blasts instead of wasteful constant flow. This saves you air and money.

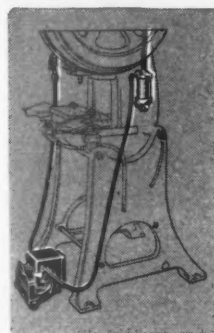
New utility. Even the most skeptical production men are amazed at the number and scope of jobs performed with air *power*. Drilling, boring, tapping, pressing, feeding, ejecting, and countless other operations are made easier with less fatigue, using Schrader compressed air equipment.

Look into the advantages of the Schrader complete line for new economy, new utility, new safety features and relief from operator fatigue.

Write for 48 page catalog No. 10. Schrader devices are available through your distributor. If a Schrader engineer is required for large installations or particularly complicated jobs he, too, is available by arrangement through your distributor.

Power Press and Kick Press Controls Complete, eliminate operator fatigue and incorporate safety features. Also Air System Accessories (check valves, rotating joints, speed control valves, air strainers, 4-way valves and cylinders), Hydraulic Gauges, Air Hose, Hose Ferrules and Tools.

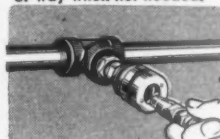
MADE BY THE MAKERS OF SCHRADER TIRE VALVES AND GAUGES



TIP TOE CONTROLS—free hands for guiding or feeding work. Eliminates foot fatigue.



HOSE REELS—air handy where you want it—hose out-of-way when not needed.



QUICK-ACTING AIR COUPLERS—with "safety twist".

Schrader

REG. U.S. PAT. OFF.

CONTROLS THE AIR



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ROLL ON **ABBOTT** *Bearing* **BALLS**



CARRY THE LOAD AS PLANNED

Today, Design and Production Engineers direct their plans to the essentials of war. Today, ABBOTT BEARING BALLS are contributing to the success of these plans by assuring uninterrupted performance — ABBOTT carry the load as planned.

With the approach of Victory, plans and ideas will broaden — new mechanisms — new assemblies — new load carrying conditions will need to be solved. Then too, ABBOTT BEARING BALLS will be ready to cope with punishing loads, jolting shocks, hard usage — ABBOTT will "Carry the Load as Planned".

ABBOTT GIVES UNINTERRUPTED

DELIVERY ESTIMATES
PROMPTLY GIVEN

PERFORMANCE

ROLL ON **ABBOTT** *Bearing* **BALLS**
THE ABBOTT BALL COMPANY HARTFORD, CONN. U.S.A.

(Continued from page 202)

OREGON ASSOCIATION HOLDS ANNUAL DANCE

The Purchasing Agents Association of Portland, Ore., held its annual dance at the Oswego Country Club, Saturday, March 15. Clyde Ginn was chairman in charge of the affair.

1 1 1

BUYING FOR AN ARMY POST KALAMAZOO

Captain Claycom, Post Buyer, Fort Custer, spoke on the subject "Buying for an Army Post in War Time," at the March 2nd meeting of the Kalamazoo Valley Association of Purchasing Agents, at the Columbia Hotel, Kalamazoo, Mich.

1 1 1

OFFICIAL WAR PICTURES AT CANTON

The March 15 meeting of the Canton & Eastern Ohio Association of Purchasing Agents, which was held in the Elks Club, was devoted to a showing of official war pictures recently released by the War Department, Washington, D. C.

List of war films available for special showings, may be obtained from the Industrial Inquiries Division, U. S. Navy, 2118 Massachusetts Avenue, N.W., Washington 25, D. C.

1 1 1

"FOOD, WAR AND THE PEACE" COLUMBUS

Murray D. Lincoln, general manager of the Ohio Farm Bureau, addressed the Purchasing Agents Association of Columbus on "Food, War and the Peace", at its March 13 meeting held in the Fort Hayes Hotel, Columbus.

1 1 1

CLAUDE R. FRIESNER HEADS EASTERN NEW YORK ASSN.

The following slate of officers for the 1944-45 term, was nominated at the March 16 meeting of the Purchasing Agents Association of New York, held at Albany:

President, Claude R. Friesner, Albany Corrugated Container Corp., Cohoes.

Vice President, George B. Tod, Schenectady Varnish Co., Inc., Schenectady.

Treasurer, Stephen C. Main, National Commercial Bank & Trust Co., Albany.

Secretary, William B. Gardner, Socony Vacuum Oil Co.

National Director, Harry L. Erlicher, General Electric Co., Schenectady.

Executive Committee: Charles F. Straney, Albany Steel & Iron Supply Co.; William A. Reid, Schenectady Railway Co.; and, Reginald B. de Varennes, Rensselaer Valve Co.

More than 400 were in attendance. H. L. Erlicher, General Electric Co., presided as toastmaster at the dinner. Speaker for the evening was Hiland B. Batcheller, president of the Allegheny-Ludlum Steel Corp. Speaking on "Gov-

(Continued on page 206)

NATIONAL SCREW OF CLEVELAND

makes the famous Phillips Recessed Head Screws and Bolts, scientifically engineered for fast-starting, faster and easier driving, better fastenings.



7 distinct advantages of the Phillips Recessed Head

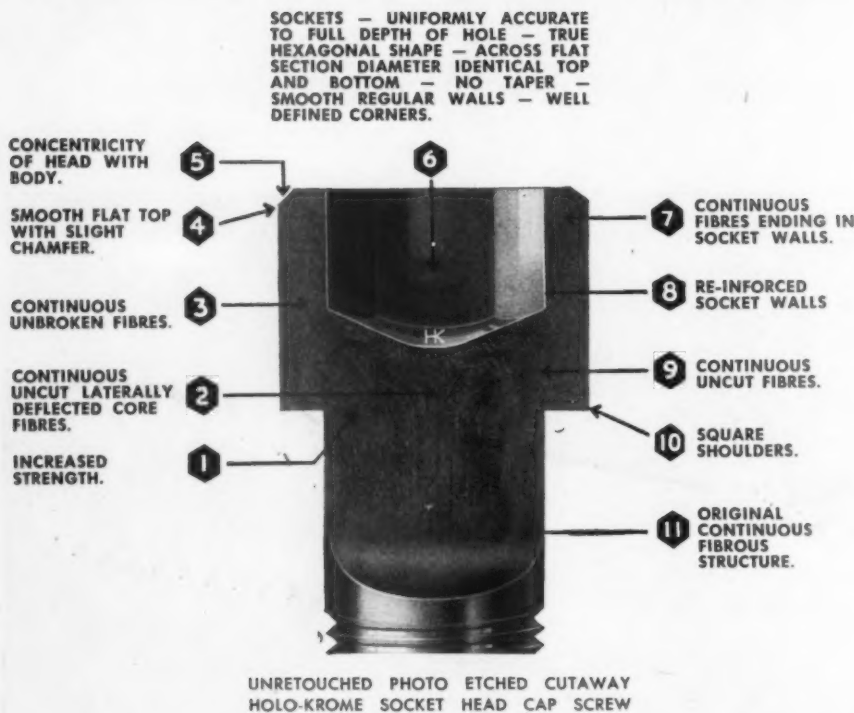


1. Self-centering on the driver
2. Holds driver from slipping
3. Four "wings" give greater driving power
4. Eliminates head breakage
5. Frees operator's hand to hold work
6. Makes better appearance—prevents marring work
7. Simplifies hard-to-get-at jobs

National
HEADED AND THREADED
PRODUCTS

THE NATIONAL SCREW & MFG. CO., CLEVELAND 4, O.

Completely Cold Forged



THE HOLO-KROME METHOD PRODUCES THE RESULT

In Socket Screws where strength in the shoulder and in the Socket is essential, continuous fibres are of vital importance . . . In Holo-Krome FIBRO FORGED Screws the fibres originate in the shank and continue uninterrupted, unbroken and uncut around the socket bottom between it and the shoulder of the screw and terminate in the socket walls. The finished product has all the advantages of the original material plus the additional strength imparted by the Holo-Krome

Completely Cold Forging process . . . The Holo-Krome Method produces the result.



GUARANTEED UNFAILING PERFORMANCE

THE **HOLO-KROME** SOCKET SCREW PRODUCTS — SCREW CORP. HARTFORD 10, CONN. U. S. A.

(Continued from page 204)

ernment Facilities and Controls in War and Peace", Mr. Batcheller suggested that some of the facilities should be transferred to their sponsors, and that terms sufficiently reasonable to permit their continued operation in replacement for older, less efficient machinery should be arranged. Other facilities could be dismantled and the equipment lent or sold to our Allies or other friendly nations, he said.

Mr. Batcheller expressed himself as opposed to a contemplated increase in bureaucratic control in the post-war era, declaring that proposed regulation of industry might have consequences in the post-war world infinitely more serious than those of the pre-war years. "Whether the problem is one of reconversion, distribution or surplus goods, utilization of war facilities or what have you in the way of a post-war problem, I agree the economic life of this nation must not be permitted to become dependent upon Washington for directives for peace as it has been for war", he asserted.

1 1 1

"THE PROBLEM OF SURPLUS" NEW YORK

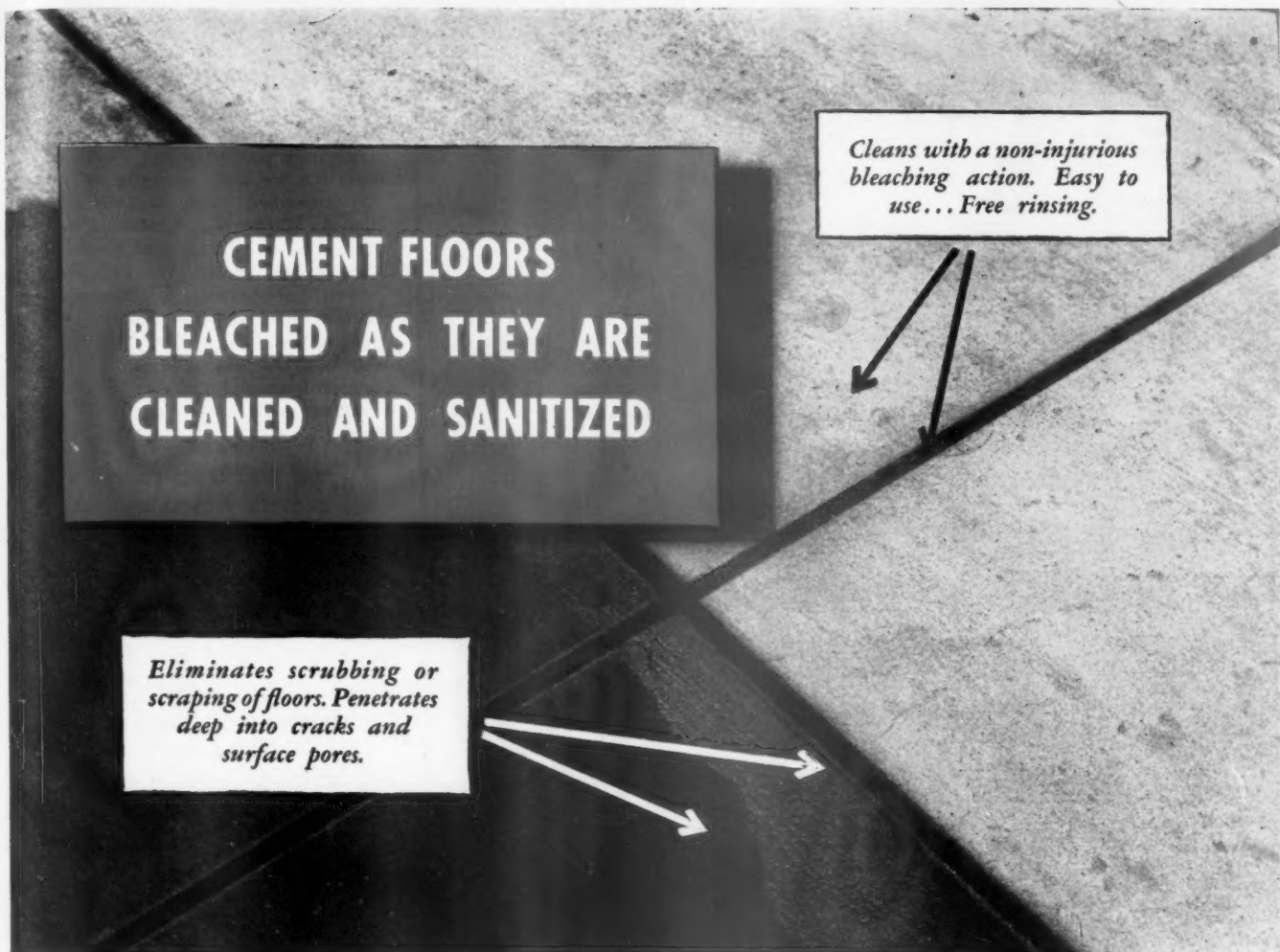
Clifton E. Mack, Director of Procurement, Treasury Department, Washington, and president of the Purchasing Agents Association of Washington (D.C.) addressed a well attended forum meeting of the Purchasing Agents Association of New York, on "The Problem of Surplus", at the Builders Exchange Club, March 21. At the dinner meeting following, William J. Caldwell, radio operator and gunner on the flying fortress "Goonie Bird", gave an "Eye Witness Report of the War with Japan." Caldwell was at Pearl Harbor during the Jap sneak attack, fought all through the battle of Midway, and during a year's stay on Guadalcanal and in the Solomons he engaged in 65 bombing missions. His group was cited by the President for sinking or damaging more than 30 enemy ships. The Goonie Bird also shot down 19 aircraft, Caldwell personally accounting for more than the "ace making" five. He was twice wounded; was awarded the Purple Heart, Distinguished Flying Cross, Air Medal Oak Leaf Cluster, and was also decorated by the French, Dutch, British, Australian and New Zealand governments. Last November he was given a medical discharge due to wounds received in combat.

1 1 1

MEMPHIS WOMEN'S CLUB VISITS ARMY HOSPITAL

In keeping with the broad aspects of its general educational program, and the development of background material, the Women's Purchasing Agents Club of Memphis, Tenn., made a tour of the Kennedy-General Hospital, Memphis, a 3,000 bed army unit, on March 13. They were conducted through the huge establishment by Capt. Lester A. Rosen, Director of Supplies and Purchasing and Contracting

(Continued on page 208)



Turco Aktiv Does These *Three* Important Jobs in One Simple Operation

Turco modern chemistry has produced in Aktiv a specialized cement floor cleaner that is exceptionally effective. Not only does it speedily and thoroughly emulsify grease and oil, it penetrates deep into cracks and surface pores, ordinarily uncleanable. The dirt comes to the surface where cold water will flush it away without trace. But that's not all: Turco Aktiv also sanitizes as it cleans, whitens cement with a non-injurious bleaching action.

A granular material, Aktiv is safe and pleasant to use at all times. As it dissolves completely in water, it may be made into a stock solution for immediate use. Or sprinkle on a wet floor and, in a few minutes, lightly work into cracks and rough spots with broom or brush, hose off or mop with clear water. Hard scrubbing or scraping is eliminated.

Aktivating cement floors is very inexpensive. Let the Turco Field Service Man show you. Write today.

Other Specialized Turco Products for the Food Processing Industry

Blu-Fax, for light duty cleaning of floors, walls, and factory equipment.

Lustrite, for safely cleaning Linoleum, Composition and Rubber Tile.

Title-O, for bleaching Ceramic Tile, Terrazzo, Porcelain. Removes rust stains and hard water spots in washrooms.

Glyst, for cleaning windows and other glass. Is not oily; leaves no film.

Steamfas "Water-Conditioned" Steam Vapor Cleaning Compound. Prevents scale formation in machine. Less required in hard water.

Rust-Evade, protects metal from rust and corrosion. Does not peel or slip.



Turco

Write Dept. P-4

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FOR YOU

**...war-tested ideas
for more successful
post-war products**

**...with parts of wear-resisting
Ampco Metal**

To avoid costly failures and breakdowns in equipment you build or buy — now or post-war — it pays to specify Ampco Metal for parts subject to wear, impact, or corrosion. Ampco Engineering Data Sheets illustrate dozens of applications of this remarkable alloy of the aluminum bronze class — which lasts several times as long as ordinary bronze. Here is the condensed experience of over 2000 users in war and peace.

A-2

Ampco's nation-wide organization of field engineers is available to help you solve your problems of metal failure.

**AMPco
Metal**

The Metal without an Equal

AMPco METALLURGICAL SPECIALTIES
Ampco Grades 12 to 22 (special alloys of the aluminum bronze class) . . . Ampcoloy (general industrial bronzes) . . . Special Custom Copper-base Alloys.

Sand Castings . . . Centrifugal Castings . . . Extruded and other Wrought Products . . . Precision-machined Parts . . . Ampco-Trode (coated welding electrodes) . . . Ampco Non-Sparking Safety Tools.

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Valves . . . Engines . . . Ordnance . . .
Ships . . . Heavy Machinery . . . etc, etc.
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Please send File 41 of Selected Engineering Data
Sheets, copy of Catalog 23, and special data sheets on

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Company _____
Address _____
City _____ State _____

(Continued from page 206)

Office. About thirty of the members made the tour.

This was followed by a dinner-business meeting presided over by President Juanita Williams, U. S. Engineers. A nominating committee for election of officers for the term commencing June 1st was appointed, with Mrs. Sue Rauch, Phoenix Rubber Co., Chairman, and Miss Marie Bosler, Chicago and Southern Airlines, and Jane Inez Gordon, Woodson-Tenent Laboratories. Election will take place at the May meeting.

As a result of the visit to the Kennedy-General Hospital, the Club will sponsor a ward for the entertainment of wounded soldiers twice a month.

1 1 1

"MR. BEET GOES TO TOWN" SEATTLE WOMEN'S GROUP

The Seattle Women's Purchasing Group witnessed a showing of the motion picture "Mr. Beet Goes to Town" at its March 9th meeting in the Gowman Hotel, Seattle, Wash. The pictures were shown by Paul E. Kirker.

1 1 1

SHIPPING CONTAINER ORDERS KALAMAZOO

H. R. Comrie, District Priority Manager, District Office of WPB, led a discussion on containers, as covered by Preference Rating Orders P-140 and 146, and crating lumber, Preference Order M-208, at the March 15 meeting of the Purchasing Agents Association of Kalamazoo Valley, at the Columbia Hotel, Kalamazoo.

1 1 1

GEORGE RENARD SPEAKS AT DETROIT MEETING

Executive Secretary George A. Renard of the National Association was the principal speaker at the March 23rd meeting of the Purchasing Agents Association of Detroit, packing the usual punch in that comprehensive theme "From One P. A. to Another."

1 1 1

PITTSBURGH ASSOCIATION PLANS FOR ELECTION

The nominating committee of the Purchasing Agents Association of Pittsburgh, Pa., P. B. Zoeller, chairman, has submitted the following slate for action at the April 18 meeting of that body:

President, J. H. Phillips, Pittsburgh Steel Co.;

Vice President, A. W. Anderson, Kerotest Mfg. Co., and, Walter Brubach, Gulf Oil Corporation;

National Director, R. O. Keefer, Aluminum Co. of America;

Treasurer, E. C. Buerkle, National Bearing Metal Co.;

Secretary, C. H. Rindfuss, Pittsburgh Screw & Bolt Corp.

At the March 21 meeting of the association held in the William Penn Hotel, Secretary George A. Renard of the National Association was guest speaker.

(Continued on page 210)

FIBER SHEET PACKINGS

ARMSTRONG'S NO. 841

FIBRATED LEATHER

For sealing oil, water, or gasoline—especially in heavy-duty applications—use Armstrong's No. 841 Fibrated Leather. This unique gasket material is made of live leather fibers and a protein binder. It is highly resilient, tough, impervious to liquids, and stable under varying conditions.

ARMSTRONG'S NO. 743

NONCORROSIVE

Here's a new, noncorrosive gasket material—developed especially for use with alloys of aluminum, magnesium, steel, zinc, or copper. It does not corrode these metals even in the presence of moisture or salt water. Its other properties are equal to those of Armstrong's No. 841.

ARMSTRONG'S NO. 1242

GENERAL-PURPOSE

This low-cost gasket material is recommended for sealing oil, gasoline, or water under ordinary conditions. Armstrong's No. 1242 provides an economical, sure seal where service conditions do not require the superior qualities of No. 841.

ARMSTRONG'S
FIBER SHEET
PACKING
MATERIALS

YOU can get prompt delivery of Armstrong's Fiber Sheet Packings in rolls, sheets, or in gaskets die-cut to your specifications. For information about sizes and standard thicknesses, and for samples, write for Armstrong's new folder, "Fiber Sheet Packing Materials." Write, too, for data about any of the other Armstrong's Industrial Products listed on the right. Address Armstrong Cork Company, Industrial Division, 7204 Arch Street, Lancaster, Pennsylvania.

NOTE: All three Armstrong's Fiber Sheet Packings meet the following specifications: Federal E-HH-P-96a; U. S. Navy 33 P 22b; Underwriters' Laboratories, Inc. (for sealing hazardous liquids).

Armstrong's Industrial Products

GASKETS, PACKINGS, SEALS, and MECHANICAL SPECIALTIES of Cork, Synthetic Rubber Compositions, Cork-and-Synthetic-Rubber Compositions, Cork-and-Rubber Compositions, Fiber-Type Materials, and Rag Felt Papers.

RESILIENT SURFACINGS (for desks, counters, etc.) and **FLOORINGS** (for buses, railway cars, etc.) of Linoleum, Linowall, Linotile (Oil-Bonded), Airoflor, Armo-flor, Asphalt Tile, Automat, Cork Tile, Monowall, and Traffex.

TEXTILE MILL SUPPLIES - SHOE MATERIALS
ADHESIVES - GLASS INSULATORS

... These are only a few of the more than 360 products of the sixteen plants of the Armstrong Cork Company.

ARMSTRONG CORK COMPANY

INDUSTRIAL  DIVISION



HOLTITE-Phillips RECESSED HEADS SCREWS and BOLTS

Cut Fastening Time

**ASSEMBLING
OPERATIONS**

can be done with

Speed, Safety and Efficiency by-
WOMEN and all GREEN HANDS

up to
50%
and more

HOLTITE-Phillips Recessed Head Screws and bolts provide the safest, most efficient method of accelerating assembly operations. These modern fastenings can be hand driven or power driven by inexperienced women workers and all green hands. Basic training time is cut to a minimum and production increased without hazards of injuries, work spoilage or burred heads. Driven by experienced workers, HOLTITE-Phillips screws and bolts reduce fastening time and costs up to 50% or more.

Another great saving in production time is effected when Speed Nuts are used with HOLTITE Sheet Metal Screws in place of machine screws. The small tapered point permits the nuts to be run on with a much quicker start, and the smooth, faster lead threads further reduce turning time.

Used in sheet metal, castings, plastics, these "Thread-Forming" screws eliminate tapping operations by cutting their own threads in the material as they are driven in.

Check your fastening operations NOW — It will pay you, and it's patriotic to adopt these production time-savers.

Specials

With complete, modern equipment, laboratories and facilities for producing Special fastenings and parts we can meet efficiently all requirements exact to specifications.

Each order is studied in our laboratories to determine the most suitable metal, heat treatment, finish and all other elements of fabrication upon which successful performance depends. Send blueprint, specifications or samples for estimate.



CONTINENTAL SCREW CO.

New Bedford, Mass., U.S.A.
BUY MORE WAR BONDS

SECRETARY RENARD ADDRESSES NEW ENGLAND COUNCIL

Executive Secretary George A. Renard of the National Association was one of the principal speakers at a meeting of the New England Council, held in New Haven, Conn., March 17.

Commenting on the Baruch-Gancock demobilization plan, he declared that it is "meant for Government rather than for business", and therefore industry must not wait for Government planning, but should plan for its own return to peace to avoid "regimentation".

The first steps of demobilization are already under way with the growing contract cancellations and cutbacks and conversions, he said, and business should not ask Government to solve its problems, he said.

Have Records Ready

"Know what claims you can make, how to make them and have the records ready to support them—that, and only that, will handle the cancellation problem industry.

"Certainly no businessman or Government official can tell American industry how to reconvert, terminate contracts, or dispose of surplus. There is no magic formula to handle that endless variety of operations and conditions. There will be no postwar plan for your business unless you make it; Government can set policies through legislation and regulations, your business and trade associations can furnish the organization ideas and background, but the driving power must come from each company and its organization.

"Business leaders may take a tip from Mr. Baruch and set a hypothetical X-day when war work will be reduced or stopped. On this day every division must be ready to make the change."

1 1 1

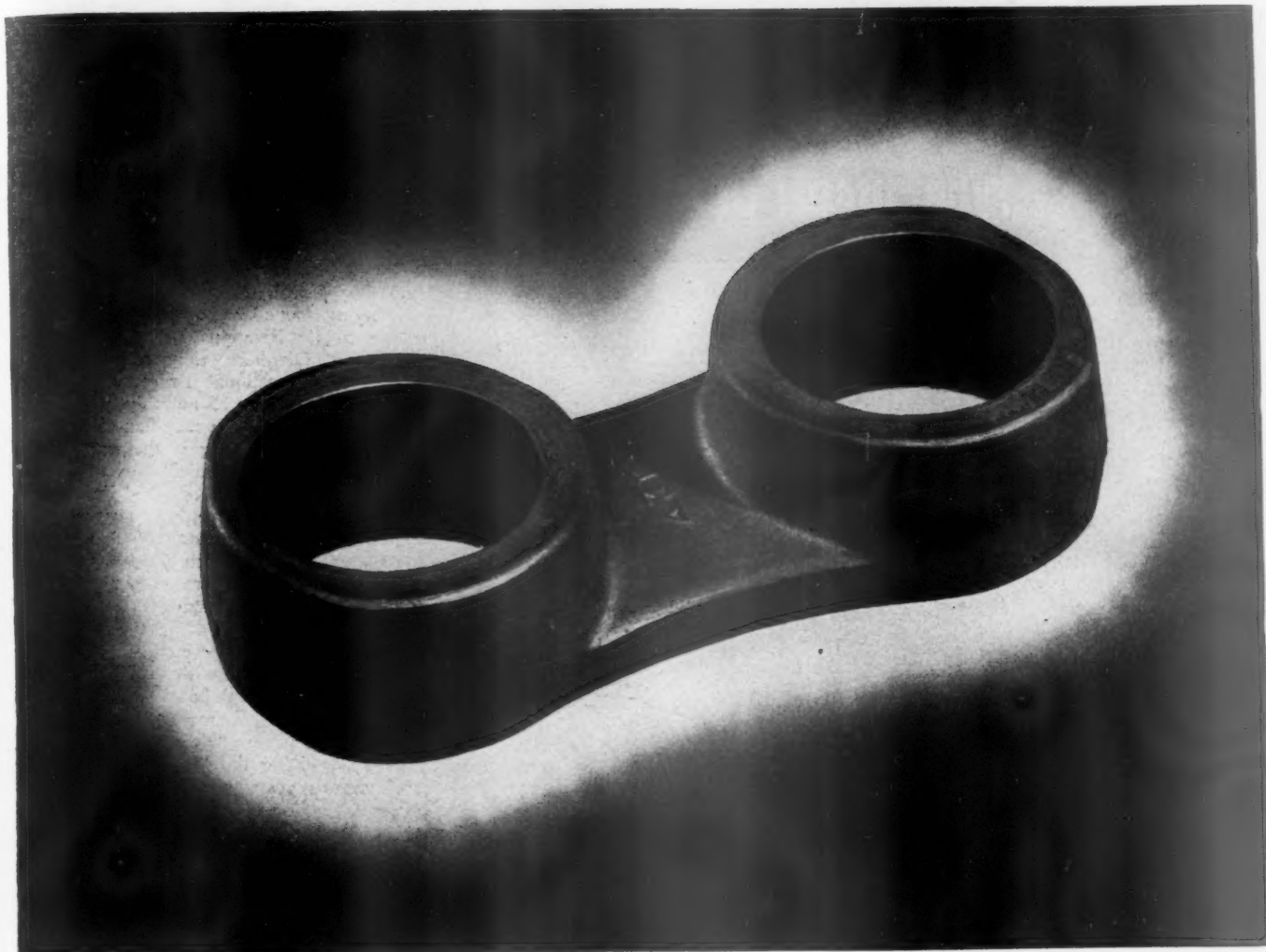
DR. JOHN C. ARMSTRONG ADDRESSES ROCHESTER MEETING

Dr. John C. Armstrong of St. Bonaventure College was the feature speaker at the March 23 meeting of the Purchasing Agents Association of Rochester, N. Y., held at the Rochester Club. His subject was "Beyond Victory", in which he talked about the responsibilities of the purchasing profession in the postwar era. Another interesting speaker was Irving Devendorf, who spoke on the leather market.

1 1 1

TOM JOLLY ADDRESSES LOUISVILLE ASSN.

Thomas Daniel Jolly, vice president, Aluminum Company of America, in charge of engineering and Purchasing, spoke on "The Purchasing Agent and the Future" at the March 21st meeting of the Purchasing Agents Association of Louisville, Ky. He was followed by Prof. N. Williams, monthly speaker from the University of Louisville. In the social hour following, "1943 World Series" sound pictures were shown.



NO EXCESS BAGGAGE HERE!



DEADWEIGHT IN A machine part is just so much excess baggage, and its elimination contributes directly to the improved efficiency of the machine.

Weight reduction is a common result of using forged parts.

In the first place, the process of forging kneads the fibres into a dense, sinewy mass of concentrated strength. Controlled grain flow and metal distribution insure extra stamina at points of greatest stress and strain.

Consequently, drop-forgings can usually be made with lighter sectional thicknesses without any sacrifice of strength.

The advantages of Forgings by Phoenix have contributed greatly to the efficiency and durability of many types of equipment now used by our armed forces. And they can be of equal value when applied to your postwar products. A Phoenix engineer will be glad to discuss your problems with you and give you the benefit of his experience without obligation.

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PENNSYLVANIA

Forgings by
PHOENIX

LUNKENHEIMER VALVES

whatever type..mean better service



Fig. 16
"Renewo" Globe



Fig. 1640
"King-clip" Gate

Fig. 2125
Bronze Gate



Fig. 1430
Iron Body Gate



Fig. 1938
Steel Gate



Fig. 123
"N-M-D" Globe
(Non-Metallic Disc)

In the heavy duty that Lunkenheim Valves are doing on every front—industrial, maritime, army and navy, chemical, petroleum, synthetic rubber—a prime attribute is lasting quality . . . that inherent quality that comes of correct engineering, simplicity of design, and "know-how" manufacturing born of long experience.

These features in Lunkenheim Valves are proving a boon to maintenance crews, in uninterrupted performance, low maintenance expense, and ease in making necessary repairs . . . in short, better service.

Let your Lunkenheim distributor help you with your maintenance, repair and operating problems. His facilities and experience are at your call. Lunkenheim Catalog 78 available on request.

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NEW YORK 13 CHICAGO 6
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MEANS EASIER MAINTENANCE**

BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S.P.;
BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS

"SLIPS THAT PASS IN THE NIGHT" NORTHERN CALIFORNIA

Ira Blue, Director of Special Events, C.B.S. Station KQW talked on "Slips That Pass in the Night" at the March 7th meeting of the East Bay Group held in Hotel Leamington, Oakland, and at the March 30 meeting of the Northern California Association of Purchasing Agents, held in the Palace Hotel in San Francisco. This was a humorous talk on comic incidents that have come over the air.

On March 2nd, the San Francisco meeting was addressed by A. C. Pitto of the Public Relations Department of the Calvert Distillers Corporation on the Calvert Educational Program.

At the March 16 monthly meeting in the hotel St. Francis, San Francisco, there was a showing of the war picture "The Battle of Russia."

On March 21st, "Unfinished Rainbows", sound motion picture, was presented by the Aluminum Company of America at Oakland, and on March 28th, Jules Trefz, manager, Glass Department, W. P. Fuller & Co., Oakland, spoke on "Glass and Its Various Uses".

March 23rd the association held its annual joint luncheon with the Golden Gate Paint, Varnish and Lacquer Association. Gene K. Walker, merchandising counselor spoke on "Your Oysters, Mr. Jones!", giving the "hows" and "whys" of various postwar problems.

1 1 1

NINTH ANNUAL PACIFIC NORTHWEST CONFERENCE

The Ninth Annual Pacific Northwest Purchasing Agents Conference is scheduled to be held at Portland April 22-23—Saturday and Sunday. The Saturday session will be purely a business and educational meeting for Purchasing Agents, followed by the annual banquet in the Grand ballroom of the Multnomah hotel with special entertainment and dancing. April 23rd will be given over to golf, and visits to Portland's war industry plants.

March 18th, the Purchasing Agents Association of Oregon held its annual dance at the Oswego Country Club. On April 19th, President Ben R. Newbery of the National Association will be honor guest and speaker at the monthly dinner meeting.

1 1 1

GENEVA STEEL PRESIDENT ADDRESSES SALT LAKE MEETING

Walther Mathesius, president of the Geneva Steel Company, was the guest speaker at meeting of the Purchasing Agents Association of Utah, which was held at the Newhouse Hotel, Salt Lake City, March 9th.

1 1 1

NEWBERY GUEST OF BIRMINGHAM ASSOCIATION

President Ben R. Newbery of the National Association and Vice President W. M. Kerrick, 7th District, were guest speakers at the March 27th meeting of the Purchasing Agents Association of Birmingham, held in the Redmont Hotel.

wherever a tube is used...

Electronic heaters with inductor coils connected to terminals of Oscillator Type Tubes, are used for brazing, soldering, hardening, and bonding of small diameter parts, thin sections and low resistance materials.

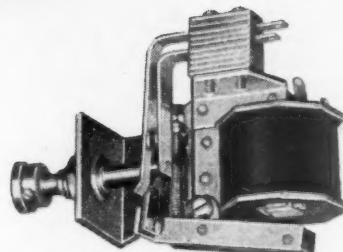
THERE'S A JOB FOR

Relays BY GUARDIAN

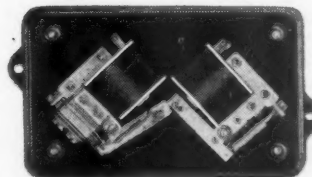
Induction heating costs less, is more dependable and easier by the electronic method. Safer, too, even with inexperienced hands, when protected from improper operation by quality relays such as the Guardian Series 90 Interlock Relay and the Series L-500 Overload Relay.

Series 90 Interlock Relay locks mechanically from an electrical impulse and unlatches or resets from another such impulse. Combinations up to DPDT available with $12\frac{1}{2}$ amp. contacts rated at 110 v., 60 cycles, non-inductive load. Coil resistances up to 10,000 ohms. For AC or DC operation.

Series L-500 Overload Relay, manual reset, protects DC circuits against abnormal current surges where current conditions are constant. Contacts can take severe overloads undamaged, cannot be reset during overload. Rated for 1500 watts on 110 v., 60 cycle, non-inductive AC.



Series L-500—Overload Relay
Ask for Bulletin R-5



Series 90—Interlock Relay
Ask for Bulletin 21

Consult Guardian wherever a tube is used—however—Relays by Guardian are NOT limited to tube applications but may be used wherever automatic control is desired for making, breaking, or changing the characteristics of electrical circuits.

GUARDIAN  **ELECTRIC**
1635-D W. WALNUT STREET CHICAGO 12, ILLINOIS
A COMPLETE LINE OF RELAYS SERVING AMERICAN WAR INDUSTRY



Double or Nothing!

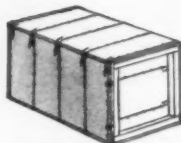
EVERY one of your containers has a double job to do. One is to get your products out of your plant. The other is to be sure that the buyer gets what he bought.

Shipment No. 1 is the product that you are proud to sell. The product that has taken many years to develop . . . years of constant improvement of design, materials, and workmanship. *Don't just put it in a box!*

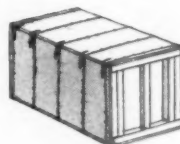
Shipment No. 2, in the same container, is the product that the buyer will receive. His need for it is often urgent, frequently critical. He will expect to receive your shipment in perfect condition. Breakage, even the smallest damage, can be vital to him. *Don't just put it in a box!*

General Engineered Shipping Containers are specifically designed to the product. They are designed to provide maximum protection. They are compact, streamlined to save space. They are light in weight to expedite handling and reduce shipping costs.

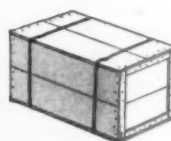
Get acquainted with the advantages of General Box Company's "Part of the Product" plan. Your postwar product and General Containers can come off the production line together . . . saving time, cutting down costly man-hours, adding to your production. Bring your container problems to General Box Company.



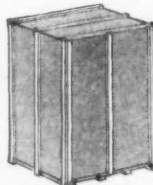
General All-Around Box



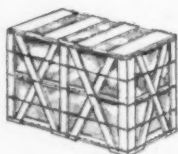
General Rock Fastener Box



General Nailed Box



General Cleated Fibreboard Container



General Wirebound Crate

ENGINEERED SHIPPING CONTAINERS

General BOX COMPANY

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DISTRICT OFFICES AND PLANTS: Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon.

Continental Box Company, Inc.: Houston, Dallas.

Send for new booklet, which illustrates General Box Company's "Part of the Product" plan. Write today.



JOINT MEETING TO BE HELD AT HARTFORD

The April meeting of the Purchasing Agents Association of Connecticut is scheduled for the 25th at the Hotel Bond, Hartford, jointly with the Hartford County Purchasing Agents Association. Alfred C. Fuller, President of the Manufacturers Association of Connecticut will be the speaker.

1 1 1

MEMPHIS ASSOCIATION ADDS SIX NEW MEMBERS

The spring activities of the Memphis (Tenn.) Association of Purchasing Agents include a city-wide campaign for new members. At the March 15 meeting held in the Hotel Gayoso, six new applications were accepted, making for a total membership of 33 active members. The new members are as follows: L. E. Johnson, Lewis Supply Co.; B. H. Wilkinson, Wurzburg Bros.; Dudley Johnson, Fischer Lime & Cement Co.; Aaron Brenner, F. Perlman & Co.; Russell E. Bloodworth, Orgill Bros.; and Miss Catherine Dowdey, Rotary Lift Company.

President W. E. Rier appointed George Nelson of the Ford Motor Co. to the office of treasurer, vice J. R. Whalen Jr. who is now in other activities than procurement. Also, J. E. Johnson was made publicity chairman.

Announcement was made that election of officers for the 1944-45 term would take place at the May meeting, President Rier appointed the following nominating committee: U. M. Finch, chairman; Martin Sunderland, John Harris, and H. J. Burton, this committee to report at the April meeting.

Visit by National Officers

A special meeting of the association was held March 29 at which the guests of honor were President Ben R. Newbery of the National Association, and Vice President W. M. Kerrick, Louisville, Ky., N.A.P.A. Seventh District.

President Rier announced the inauguration of a Purchasing Agents Library at the Cossitt Library, Memphis, to which he had contributed some 34 books and papers. Additional material will be added from time to time.

At the conclusion of the meeting at the Gayoso, the group joined with the National Association of Practical Refrigerating Engineers at the Hotel Chisca to hear G. O. Hartzell of the Owens-Corning Fiberglas Corporation of Toledo, explain the uses of fiberglas as an insulating material for steam plants and in refrigeration. Mr. Hartzell's talk was followed by a sound-picture showing the manufacture and use of the product. Each of the 300 persons attending this meeting was presented with a fiberglas souvenir, and in addition there were a number of door prizes of fiberglas.

The Memphis group is now a member of the National Association, having been accepted by that body with a charter membership of 27. The following committees have been appointed:

(Continued on page 216)



You can get **DROP FORGINGS NOW!**

An endless variety of drop forgings of the type pictured here are daily produced by the experienced, time-trained hammersmiths of Kropp Forge with special tools, dies and fixtures on flat die hammers.

Our method of making drop forgings on flat die hammers does not imply slow production, high cost or even rough dimensions, for thousands of these parts have been made in this matter that would do justice to the most exacting die forging work.

When you need forged gear blanks, cams, levers, large crankshafts, connecting rods, valve stems, spindles, trunnions, cranks or similar forgings, we can probably hand-forged them for you on flat die hammers.

Forging facility is available as fast as forging steel can be secured — send blueprints today for estimates and steel delivery details.

KROPP FORGE COMPANY

5301 W. Roosevelt Road

Chicago, Ill.

Engineering Representatives in Principal Cities



Makers of Drop, Upset and Hammer Forgings

"World's Largest Job Forging Shop"



CASTINGS

- ★ Gray Iron
- ★ Semi-Steel
- ★ High Test Semi-Steel
- ★ Any Size up to one ton

Two modern foundries equipped for fast, efficient production can meet your casting requirements.

**THE
FOREST
CITY**

FOUNDRIES CO.

2500 West 27th St.

Cleveland 13, Ohio

PHONE Prospect 5040

(Continued from page 214)

Attendance and Membership: Martin Sunderland, Memphis Union Station, chairman; Miss Mary Speltz, Memphis Plywood Corp.; Larry M. Smith, Jr., Sefton Fiber Co.; Niles O. Jackson, Carter Mfg. Co., and M. A. Stephenson, Memphis Packing Co.

Reception and Acquaintance: Frank Bryan, Withers & Wellford Co., chairman; Miss Mary Ann Bennett, Chicago and Southern Airlines; Ralph M. King, Layne-Central Co.; W. N. McKinnon, E. L. Bruce Co., and Ralph Trobaugh, F. & S. Electric Co.

House Committee: J. R. Whalen, Jr., American Finishing Co., chairman; B. L. Hand, Layne & Bowler Co., N. C. Wilson, Riechman-Crosby Co., and George Nelson, Ford Motor Co.

Auditing Committees: John W. Harris, Memphis Housing Authority, chairman; R. H. Swank, Chicago & Southern Airlines; and M. F. Wragg, Memphis Packing Co.

Program: E. M. Almy, National Fireworks Corp., chairman; H. R. Graves, National Fireworks; H. J. Burton, Memphis Paper Co.; and U. M. Finch, City of Memphis.

Publicity: Chairman, J. Ed. Johnson, Aircraft Welded Products Co.; Raymond P. Durick, Memphis National Gas Co.; and Mrs. M. K. Mountjoy, Forest Products Chemical Co.

1 1 1

DISCUSS TECHNOLOGICAL DEVELOPMENTS AT PORTLAND MEETING

Brother Godfrey, head of the Physics Department, Portland University, who has made extensive research into possible new developments after the war, spoke on "Things to Come After the War", at the March 20 meeting of the Purchasing Agents Association of Oregon, held in the Heathman Hotel, Portland.

1 1 1

ALLOY STEEL MAY BE USED IN HAND TOOLS

The War Production Board announces that alloy steel may be used in the manufacture of hand shovels, axes, heavy forged hand tools, hand forks and other items covered by Schedules I, II, IV, and V of the hand tools simplification order L-157. As amended, the schedules allow manufacturers to use alloy steel instead of carbon steel if they desire.

1 1 1

DIRECTORY OF COMMODITIES AND OPA SERVICES

A new Directory of Commodities and Services, containing up-to-date information about Office of Price Administration and a listing of key persons in operating units of the national office of OPA, is available to interested persons at cost, OPA announces.

Copies of the directory and of six supplements, which will be issued between now and August 1, 1944, may be ob-

tained for \$1 from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

The directory was designed to aid industry and the general public in keeping abreast of price regulations and in making ready contact with OPA organizational units that handle each price control program.

Included in the manual are:

(1) Names and telephone numbers of OPA persons responsible for issuance of price regulations, (2) numbers and titles of all formal price regulations effective through December 1, 1943, and the price branches that issued them, (3) alphabetical index of commodities and services, along with OPA branch and section and the number of the applicable regulation, and (4) a separate alphabetical listing of the products and services assigned to each price branch.

Supplements to be issued will include new price regulations, amendments and revisions to existing regulations and any changes that may occur in OPA organizational structure.

1 1 1

EUTECTIC WELDING ISSUES HOUSE-ORGAN

"The Eutectic Welder" is the name of a house organ "published to help welding advance to new horizons", by Eutectic Welding Alloys Co., 40 Worth St., New York 13, N. Y. Volume 1, No. 1 for January is a four-page issue, 10½" x 14", and in line with its purpose presents in easy-to-read, well illustrated text the story of Eutectic welding, and several practical examples of the utilization of low temperature welding. It also contains a selection chart of Eutectic Welding Alloy Rods and Fluxes. Subsequent issues will present new welding applications and new developments in welding design, metallurgy, methods and cost analysis.

1 1 1

COAL DIRECTORY ANNOUNCED

The 21st edition of MacQuown's Coal Directory and Buyers Guide, is announced by National Coal Publications, Pittsburgh, Pa. It gives complete, up-to-date information on companies producing and selling coal, including complete description of mines, equipment, facilities, tonnage, sales agents, etc.; information on selling companies includes location of offices, officials, sources of supply, data on coke, docks on Great Lakes; and there is a complete section devoted to anthracite and B. & O. origin coals. Approximately 800 pages (9¼ x 12"). Standard Edition \$25. Abridged Edition \$15.

1 1 1

"POST-WAR PLANNING NOW"

American industry's blueprints for the giant task of converting a record wartime production back to civilian goods without loss of employment, have been summarized in "Post-War Planning Now", a new study published by the New York Journal of Commerce, 63 Park Row, New York, N. Y. The report states that much of the conversion task will depend on the

(Continued on page 218)

SILVER RELIEVES THE TIN BABBITT SHORTAGE



Uncle Sam's Silver pays out in full. Lead-base, alloyed with silver, provides the same hot strength as tin-base babbitts, with the same general physical characteristics:

Retains hardness at high temperatures • Easy to handle and to bond
• Resists squeezing-out at operating temperatures • Corrosion resistant.

Our new bulletin and engineering briefs are yours for the asking.

NATIONAL BEARING METALS CORPORATION

ST. LOUIS • NEW YORK



PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

"LENOX" Diamondmaster

Narrow Metal Cutting Band Saws

Designed for fast precision work on all contour sawing, die-cutting and similar operations. Furnished in 100-foot coils in the following widths: $3/32"$, $1/8"$, $3/16"$, $1/4"$, $5/16"$, $3/8"$ and $1/2"$ packed in a safety box—any length material can be drawn out and window shows unused portion of coil.



They are adaptable for DO-All, Grob, Tannewitz, Laidlaw, Theill, Walker-Turner, Wells and all other die and band sawing machines.

Stocked by Distributors Everywhere

AMERICAN SAW & MFG. CO., SPRINGFIELD, MASS.

"LENOX"

"The Blade in the Plaid Box"

Steel TAPER PINS

Meet All
Army and Navy Specifications
Prompt Delivery
Accurate and Uniform
No special fitting necessary
with these taper pins.

All inquiries receive immediate
attention

MACHINE SPECIALTIES

Designers and Builders
of Special Machinery

4029 N. Kedzie Ave.
Chicago 18, Ill.

**A HALF CENTURY
PLUS — ONE**

SIMONDS for GEARS *Since 1892*

Still making good gears, after
51 years of service to industry.
A year more than a half cen-
tury of experience in the manu-
facture of all types — spur,
bevel, mitre, worm, rack, inter-
nal, etc. Also gears made to your
order. In addition SIMONDS
distributes Ramsey Silent Chain
Drives and Couplings.

THE
SIMONDS GEAR & MFG. CO.
25th and Liberty Sts.
PITTSBURGH, PA.

(Continued from page 216)

government's policy of contract termina-
tion, inventory disposal and unloading the
1,753 war plants it has spent \$9,000,000-
000 to construct during the war. "Post-
War Planning Now" was obtained from
interviews with key manufacturing execu-
tives and government officials throughout
industrial America. Copies are 25¢ each.

1 1 1

NEIL C. HURLEY JR. HEADS INDEPENDENT PNEUMATIC TOOL CO.

Neil C. Hurley was elected chairman
of the directors of the Independent Pneu-
matic Tool Co., Chicago, and Neil C.
Hurley, Jr., was elected president at the
company's annual meeting. The younger



President Neil C. Hurley, Jr.

Mr. Hurley has been associated with
the firm for twelve years following his
graduation from Notre Dame. In recent
years following his managership of the
company's electric tool division, he has
successively served as secretary, vice
president and executive vice president
Edward G. Gustafson, treasurer of the
company, and John McGuire, secretary,
were elected to the board of directors.

1 1 1

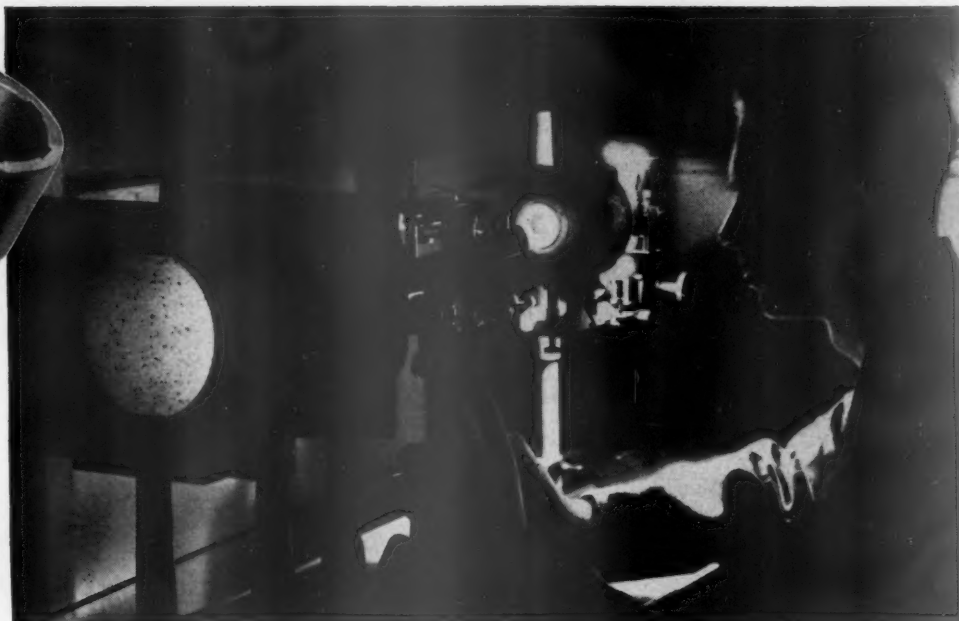
SUPPLEMENTARY IN-PLANT FEEDING RATIONS

The War Food Administration is
working out a program in cooperation
with OPA to provide supplementary food
rations to plant feeding systems, catering
to workers doing heavy work. It is
estimated that the normal rations of an
in-plant feeding system supplementing the
points available to a worker at home
will be sufficient for 3,000 calories of
food intake a day. If a plant is having
difficulty with the rationing system as it
relates to in-plant feeding, regional offices
are located in New York City, Chicago,
San Francisco, Dallas and Atlanta.

1 1 1

URGE MANUFACTURERS TO EXCHANGE CONTAINER ORDERS

Some ten thousand persons who manu-
facture and distribute 36 essential types
of containers and pulpboard have been
encouraged by War Production Board
officials to cooperate in a voluntary ex-
change of orders for containers and
pulpboard where possible so as to avoid
unnecessary transportation.



THE RIGID METALLURGICAL AND
MANUFACTURING CONTROL OF
BUCKEYE BEARINGS

*Assures thorough dispersement of all component
metals and freedom from porosity resulting in
unsurpassed serviceability*

● Manufactured from selected metals under Buckeye's complete laboratory control of charging ratios and melting and pouring temperatures, assures the production of a uniformly high quality of product, each piece of which, month after month measures up fully to Buckeye's exacting specifications.

For easy assembly and long efficient satisfactory service, specify Buckeye bearings by brand name. They are furnished fully finished in 1088 ready-to-use stock sizes—in cored and solid 13" bars—in several graphited styles—and in any OD, ID and length, slotted, split, drilled or flanged, exactly to customer's blue-print. No order is too big or too small for Buckeye.

Let us quote on your requirements.

Buckeye

BRASS AND MANUFACTURING COMPANY

6412 HAWTHORNE AVE.

BRONZESMITHS

SINCE 1900

CLEVELAND, OHIO



**BRONZE SLEEVE BEARINGS • STANDARD SIZES OR TO CUSTOMERS' BLUEPRINT
IN ANY RECOGNIZED BEARING METAL ANALYSIS**

"Cheer Up, Kay. FIRST THING TOMORROW WE'LL PUT A SUPER-ULTIMO RIBBON IN YOUR TYPEWRITER. THEN YOU'LL BE ABLE TO LEAVE AT FIVE, TOO!"



● ● That's right! When your typists use Super-Ultimo ribbons, production and tempers improve. You'll be proud to sign the letter they proudly hand you.

Save time, and brighten up the work with this sheer, long-mileage ribbon. Six degrees of high pigment content inking are available and the fabric is identified. The right ribbon for *you* and *your department* is waiting for you.

FOR CLEAR, CRISP LETTERS—STRONG, READABLE COPIES—CLEAN, SMUDGE-FREE HANDS.



Another outstanding product of the originators of 2-color Hectograph Uni-Masters!

PANAMA-BEAVER

CARBON PAPERS, HECTOGRAPH, INKED RIBBONS

Manufactured by

MANIFOLD SUPPLIES COMPANY

COAST TO COAST DISTRIBUTION

188 THIRD AVENUE • BROOKLYN 17, N. Y.

Business MACHINES and Stationery STORES



Purchasing Agent Blake checks press details of new form.

SOME 950 forms are used by The Dime Savings Bank of Brooklyn, N. Y. and its three branches, in its banking and realty lending activities. It is one of the Metropolitan area's oldest and largest savings institutions, and incident to its broad activities uses a great many types of printed matter in promotion work.

At one time the number of forms carried in the stock room was much larger, but Thomas Blake, Jr., junior officer and Purchasing Agent is intimately familiar with the operations of the bank's 20 departments, and among other things he has been consolidating forms used for overlapping services, and eliminating those that have become obsolete. In fact, a general "house-cleaning" of old and obsolete forms and other printed matter sometime ago enabled the bank to make a sizeable contribution to the waste-paper salvage campaign.

Mr. Blake, like many others having numerous small printing jobs, incident to the manpower shortage

HOBBY SOLVES PRINTING DELAYS

Purchasing Agent Installs Printing Department in Bank, Which Turns Out 3,000,000 Pieces of Printed Matter a Year

and press of work in the printing trades was experiencing difficulty in getting reasonably prompt service on printed forms, especially on small jobs.

In his college life, Mr. Blake was active on the school publication, not merely in editorial work, but also in the mechanics of production. He learned the rudiments of printing in the press room, becoming quite well acquainted with stones, chases, furniture and quoins, ems and quads, line cuts and engravings, make-up and make-ready. Likewise he gained a rather thorough knowledge of off-set and direct printing presses and their modus operandi. Leaving college, the graphic arts became a hobby, and he had a small press and

a complete line of accessories installed in the basement of his home.

Necessity is the mother of creative thinking which usually finds a practical and often advantageous solution of current problems, and so a hobby and a necessity evolved a plan that Mr. Blake was sure would eliminate irksome delays and solve most of the problems born of the bank's frequent need for small printing jobs of one kind or another. He "sold" the idea to the senior officers and today his function as purchasing officer also includes the supervision of one of the finest small printing departments in the metropolitan area.

Possibly the outstanding feature

(Continued on page 222)



An offset press in Purchasing Agent Blake's printing department.

Purchase Order, Receiving and Inspection Records

...all from a single writing

Here's a sound and simple system of purchase order control that is proving itself in large and small plants throughout the country.

It eliminates wasteful rewriting and makes possible sure, accurate control from start of the order until the stock reaches the bins.

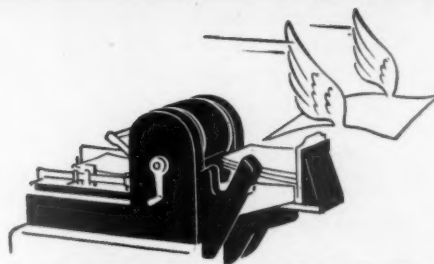
A single writing on a Mimeograph form-topped stencil sheet produces, on the Mimeograph duplicator, a combination purchase order with receiving and inspection forms—in sufficient quantities to go to everyone concerned.

Thus, everyone who needs to know has this information at his fingertips: *when* material is ordered, *what* is ordered, what is *received*, what is *accepted*, what is in the *stock bins*. A. B. DICK COMPANY, Chicago.



GET FREE FOLDER FOR FULL DETAILS

If you buy finished or semifinished parts and raw material, don't miss getting full information on this practical and efficient new system. You'll find complete details in our new folder, "Complete and Accurate Control over Purchased Parts and Raw Materials." Send for your copy today. The coupon at right is for your convenience.



A. B. Dick Company, Dept. P-444
720 W. Jackson Blvd., Chicago 6,
Send me a free copy of the folder, "Complete and Accurate Control over Purchased Parts and Raw Materials."

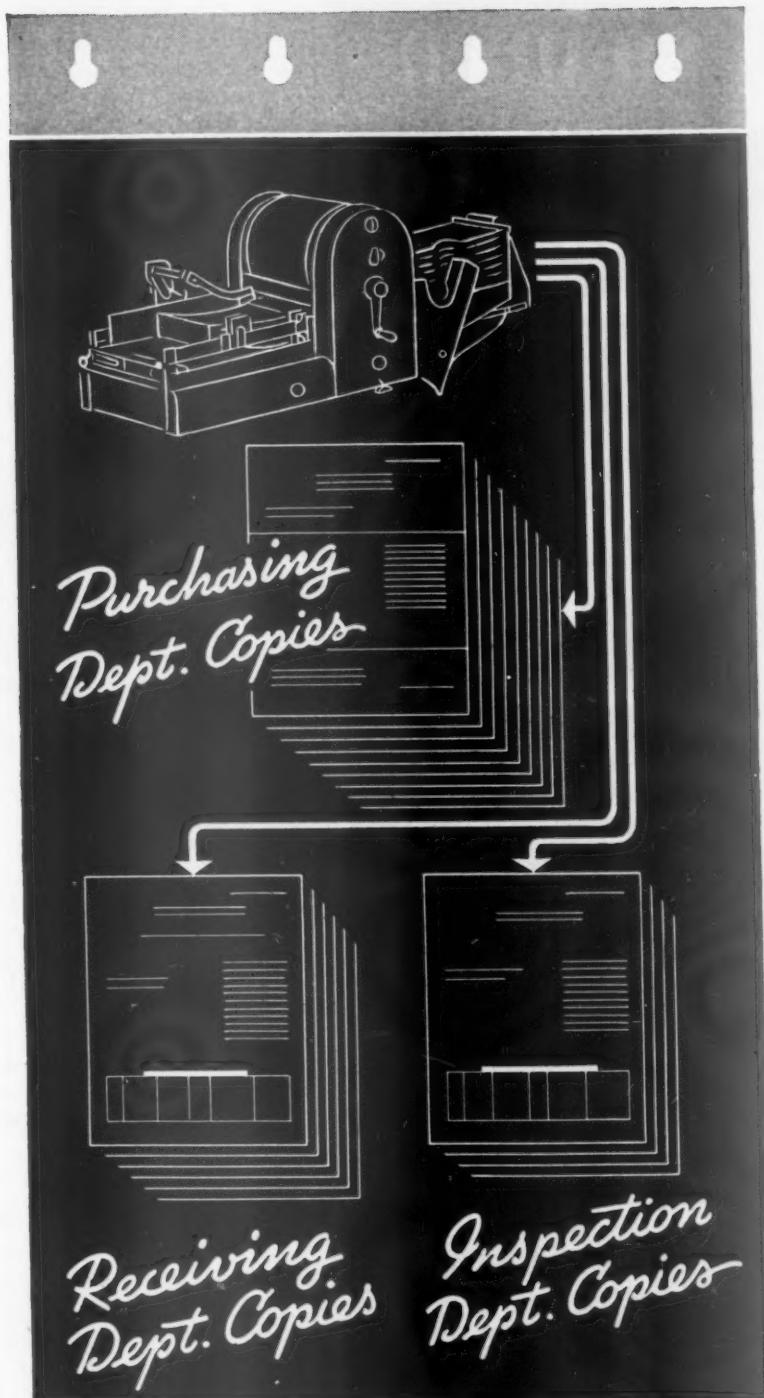
NAME

COMPANY

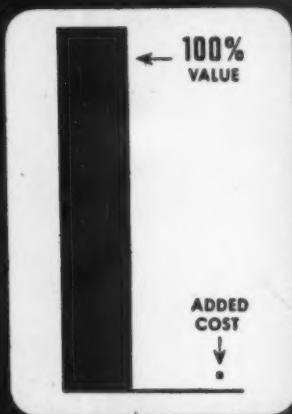
CITY STATE

Mimeograph duplicator

MIMEOGRAPH is the trade-mark of A. B. Dick Company, Chicago, registered in the U. S. Patent Office.



SO MUCH FOR SO LITTLE



PAPERS made from 100% new white cotton cuttings save critical war materials. Yet the most durable L. L. Brown ledgers*, instead of ordinary papers, add less than 1% to accounting costs, yet guarantee 100% protection—utmost resistance to wear. Ask your printer for samples of the following:

L.L. BROWN LEDGER PAPERS

* L. L. BROWN'S LINEN LEDGER
100% New White Linen & Cotton Fibres

* ADVANCE LINEN LEDGER
100% New White Cotton Fibres

FORWARD LINEN LEDGER
100% New Cotton Fibres

L. L. BROWN'S FINE
85% New Cotton Fibres

GREYLOCK LINEN LEDGER
75% New Cotton Fibres

ESCORT LEDGER & MACHINE POSTING
50% New Cotton Fibres

* Permanent Papers

L. L. BROWN PAPER CO.

ADAMS, MASS.



(Continued from page 222)
involving cuts, though illustrated jobs are also turned out on the off-set presses. A most important unit is a Varitype machine, electrically

year, but he says that this is of secondary importance. More important is the fact that printed forms and small jobs that may be covered by a morning's requisition may be had

THE DIME SAVINGS BANK OF BROOKLYN DAILY REPORT

| DEPOSITS | | | | | ACCOUNTS | | | | |
|--|-------------|-----------------|-----------------|-------|---------------------------|-------------|-----------------|-----------------|-------|
| DATE | MAIN OFFICE | BROOKLYN BRANCH | FLATBUSH BRANCH | TOTAL | DATE | MAIN OFFICE | BROOKLYN BRANCH | FLATBUSH BRANCH | TOTAL |
| DEPOSITS | | | | | OPENED | | | | |
| DRAFTS | | | | | CLOSED | | | | |
| GAIN OR LOSS | | | | | GAIN OR LOSS | | | | |
| MONTH TO DATE | | | | | MONTH TO DATE | | | | |
| DEPOSITS | | | | | OPENED | | | | |
| DRAFTS | | | | | CLOSED | | | | |
| GAIN OR LOSS | | | | | GAIN OR LOSS | | | | |
| 1ST OF MONTH | | | | | 1ST OF MONTH | | | | |
| TOTAL DEPOSITS | | | | | TOTAL ACCOUNTS | | | | |
| SAME PERIOD PREVIOUS YEAR | | | | | SAME PERIOD PREVIOUS YEAR | | | | |
| DEPOSITS | | | | | OPENED | | | | |
| DRAFTS | | | | | CLOSED | | | | |
| GAIN OR LOSS | | | | | GAIN OR LOSS | | | | |
| TOTAL DEPOSITS | | | | | TOTAL ACCOUNTS | | | | |
| BANK BALANCES | | | | | HOLD OVER CHECKS | | | | |
| MAIN OFFICE, BROOKLYN TRUST CO. | | | | | SUSPENSE F. H. A. | | | | |
| BROOKLYN, NATIONAL CITY, 10TH AVE. | | | | | " SERIES E DEFENSE BONDS | | | | |
| FLATBUSH, BANK OF MANHATTAN, COURT ST. | | | | | | | | | |
| OTHER ACTIVE BANK ACCOUNTS | | | | | | | | | |
| INACTIVE BANK ACCOUNTS | | | | | | | | | |
| TOTALS | | | | | | | | | |
| BALANCE IN ACCOUNT | | | | | | | | | |

Typical Ruled Forms developed by Mr. Blake

operated, with its many type units in varying faces and sizes. To round out the equipment, there is also a folding machine.

In addition there is a fully equipped photostat department, a corner of which is allotted to another piece of equipment unique in business offices—a rubber-stamp vulcanizing unit. More will be said about this later.

Mr. Blake characterizes the printing department as a "convenience department". The department actually operates at a small profit,

the next morning if the emergency so demands.

One of the important advantages offered by the printing department is that it permits of experimental work with forms before a stock supply is run off. The designing of complicated forms, like the designing of a house, often leaves something to be desired in spite of careful planning, and the typography is expensive. Also, many suggested forms have limited use, and on a short run and limited use-basis are quite costly. Again many special re-

THE DIME SAVINGS BANK OF BROOKLYN
36 KALB AVENUE AND FULTON STREET
Brooklyn, N. Y.

Order No. 2601 _____

To _____

Please deliver _____

Purchase Order-Check Requisition form used by Dime Savings Bank.

CHECK REQUISITION

Charge % _____ Amount \$ _____

Order No. 2601 _____

DRAW CHECK TO ORDER OF _____

For _____

RECEIVED _____

BILL APPROVED _____

PAYMENT APPROVED _____

DATE PAID _____

THE DIME SAVINGS BANK OF BROOKLYN
by _____

CHECK NO. _____

based on amortizing the cost of the equipment, printer's salary and incidental expenses, pitted against commercial printing costs. The savings may approximate some \$3,000 a

ports have been born of war conditions, and when forms are changed on short notice it means "rush" jobs, delays and heavy expense.

(Continued on page 226)

—When Time, Space and Manpower are Essential Savings



Cardineer

ROTARY FILES

Hundreds of great corporations have turned to Cardineer as the most efficient means of handling records. Built on the wheel principle it houses 6000 cards within easy reach of the operator. In many concerns it has stepped up output of finding, posting and reference work as much as two and three times over old methods. Portable—compact—speedy, Cardineer aids production by releasing workers for other essential jobs. Ready now for *immediate* delivery. Comes in five models.

Write for full information.

DIEBOLD INCORPORATED

Canton 2, Ohio

ASK FOR YOURS: Booklets in time-money saving are free as follows: check and pin on your letterhead: Inventories ☐, Costs ☐, Payroll and Personnel ☐, Plant and Equipment ☐, Purchases ☐, Production ☐.



**BUY
WAR
BONDS**

DIEBOLD ARMOR

For America's Armed Forces

We are operating all our plants 24 hours a day, making armor plate for U. S. planes, scout cars and half-tracks.

DIEBOLD

"Systems to Fit the Routine"

CARDINEER

Rotary Files

TRA-DEX

Vertical Visible Files

FLEX-SITE

Visible Book

Solve the problem... Speed the work... Reduce the cost



"... BUT APPARENTLY it was just another gab fest — a waste of our time and the company's money. Nobody seems to know what was decided or who is to do what and when. That's the last meeting of that kind I want in this office. I'm going to dictate a memo about it right now."



"... AND HEREAFTER we're going to write down the purpose of each conference — on paper. We'll decide who is to be present, and set down — on paper — what information, figures or charts each man is to bring. Then we'll put our decisions in writing, and report and check results — on paper."



IF TOO MANY of your business meetings degenerate into pointless talk, this Hammermill idea-book, "How to Harness a Conference," will be useful to you. It suggests ways to plan and guide business conferences, get decisions quickly, turn decisions into action. Send for this helpful book. It's free.



Hammermill Paper Company
Erie, Pennsylvania

Please send me—free—the new "Hammermill Form Designing Kit" and include a copy of the handbook, "How to Design a Business Form."

Name _____ Position _____
(Please attach to, or write on, your company letterhead) P-AP

(Continued from page 224)

Mr. Blake easily solved the problem of expensive ruled forms. He is one of the few persons who, among other attributes, has the ability to draw a straight, true line, light or heavy, with the aid of a ruler. It is his practice to design and rule new forms and reruns of old ones. The printer adapts the typography to the ruled form on the varityper, and the form is then ready for the preliminaries of the offset process.

The "Daily Report" illustrated is one of these jobs. It will be noted that the Gothic face is printed in three ways, namely, regular, condensed and extended, and the form identification at the top is another type face. Type faces are available in a number of sizes from 8 to 14 pt. in both light face and bold face. Where larger or display type is wanted, the letterpress is called into play. In addition, there is an electric typewriter in Mr. Blake's office which is used as one of the important adjuncts of the printing department, for its uniform, clean-cut typing is ideal for offset work reproducing form letters and the like.

Press Runs Up to 150,000

The runs on the offset presses range from a few hundred (limited runs at little cost offering one of the advantages) to many thousands. Among the forms used in great number are withdrawal and deposit tickets. These are usually printed in lots of 150,000. On these small forms, four to eight are usually run at one time, depending upon the size of the form and the run.

The printing assignments range from small forms, mailing pieces, letter inserts, and folded pieces, to ledger and bookkeeping forms and special forms used in the many departments of the bank.

Form work is done on varying fine papers, according to the use to be made of the forms. If they are to be handled or thumbed a great deal, 100% rag stock is used therefor. For ledger sheets and important forms that are kept in binders, 50% rag stock is used. For all ordinary office and banking forms, circulars, inserts and so on, a No. 1 or No. 2 sulphite 16# stock is used.

As is to be expected, all of the work reflects the high grade institution that uses it, whether forms, envelopes, three-color inserts, or the statements prepared for the weekly meetings of the bank's officers.

(Continued on page 228)

YOU'RE SAVING WASTE PAPER

... BY THE POUND!

Now!

Save paper waste

...by the mile!

A SERIOUS SHORTAGE IN PAPER
USED FOR RECORDS AND COMMUNICATIONS THREATENS
THE NERVE SYSTEM OF YOUR BUSINESS

LET'S ADMIT IT. It's more than a paper shortage you're facing today. It's a breakdown in the very *nerve system* of your business. For the flow of production in *every* war plant depends, from beginning to end, on vital written records... *on paper*.

Where is more fine paper for records coming from? Not from more wood pulp, already short. Not principally from salvaged *waste* paper. It can come mainly from only one place. From paper saved *instead* of wasted. From skillful designing of printed forms and systems of control that makes *less* paper do *more* work... that saves inches which multiply into *miles*.

STANDARD SPECIALISTS will welcome an opportunity to study accounting and control systems in your plant and make suggestions which may not only simplify paperwork and conserve paper, but also save valuable time, energy, man power and equipment. There is no charge, of course. No obligation.

The STANDARD REGISTER Company

DAYTON 1, OHIO

Pacific Coast: Sunset McKee-Standard Register Sales Co., Oakland, California.
Canada: Crain Printers, Ltd., Ottawa. London: W. H. Smith & Son, Ltd.

SEND FOR FREE CHART

MAIL COUPON TODAY

THE STANDARD REGISTER COMPANY
205 Albany St., Dayton 1, Ohio

Send your FREE CHART showing the "nerve system" of industry and how to "save paper by the mile"... in 61 places.

NAME _____

TITLE _____

FIRM _____

ADDRESS _____

HOW YOUR STANDARD SPECIALIST MAY HELP YOU SAVE PAPER BY THE MILE

- 1 7.1 miles of paper were saved in a typical instance (on the usage of 25,000 sets of forms annually), by skillful reduction from $8\frac{1}{2} \times 8\frac{1}{2}$ to $8\frac{1}{2} \times 6\frac{1}{2}$ size through Standard Formcraft engineering.
- 2 6.6 miles of paper saved is not unusual (annual usage of 50,000 forms) where two forms are combined for one-time writing.
- 3 3.4 miles of paper represents a saving made when analysis of three related records showed that one could be eliminated.

Standard is the originator, in continuous business forms, of these distinctive marginally punched holes which are Marks of Identity of the continuous forms of The Standard Register Company—"the Forms with the Punch."



When Five O'Clock Hands



Have Six O'Clock Dates

Dainty fingers that hold dinner menus at six are often the same as those on ribbon, carbon and ink-stained "holograph hands" at five. Columbia Rainbow Hand Cream is the magic medium responsible for this Cinderella-like transformation.

Office and personnel managers readily recognize the importance of caring for "office hands". Because Columbia Rainbow Hand Cream contains many of the same soothing emollients that are used in the finest cosmetics, it has met with wide popularity among war-busy office and factory workers. It is rubbed on the hands like any cosmetic cream; then a cloth is used to wipe away all stains and dirt, leaving the skin smooth and refreshed.

Ask your dealer or the Columbia office nearest you for prices and a demonstration on Rainbow Hand Cream.

C O L U M B I A
RIBBON & CARBON
MANUFACTURING CO., INC.

Main Office & Factory
Glen Cove, L. I., N. Y.

NEW YORK • KANSAS CITY, MO. •
CHICAGO • DETROIT • MILWAUKEE
• MINNEAPOLIS • NASHVILLE •
PHILADELPHIA • PITTSBURGH •
PORTLAND, ORE. • CINCINNATI

(Harris-Moers Company)
Also: London, England; Sydney, Australia



COLUMBIA
Rainbow
HAND CREAM

(Continued from page 226)

However, big volume printing jobs and official bank stationery are contracted for with commercial printers.

Mr. Blake personally developed most of the forms used in the Purchasing Department, and many of those used in other departments. One of the interesting forms is the "Check Requisition" illustrated. It is a combined order and check requisition form. The first sheet (on white stock) is a Purchase order; the second sheet (on light tan stock) is the "Check Requisition". This is retained in the Purchasing Department until the material has been received and invoice approved, and then forwarded to the Accounting Department so that a check may be drawn. A third copy (on pink stock) constitutes the Purchasing Department's record.

Also A Photostat Department

Through his printing department, Mr. Blake elicits the pleasure of giving practical expression to a beloved hobby. He also likes to call attention to the completely equipped photostat department which turns out a goodly volume of work for the real estate department. Here also is a photographic room where negatives can be developed and prints turned out on short notice.

Mention previously was made of

a unique equipment in this room for the making of rubber stamps. The rubber stamp section all told doesn't occupy over twenty-five or thirty feet of floor space. A great number of rubber stamps are used by the bank's many departments. Many of these are short-lived, and new stamps are in constant demand. Incident to a clean-up and salvage campaign, more than a thousand old stamps were returned to the purchasing department. They gave Mr. Blake the idea of having new stamps made by one of the employees in the stockroom as they were needed, for but little time is consumed in their making. The type was on hand in the printing department, for making dies and matrices. Accordingly he acquired a small vulcanizing unit which operates at a temperature of 300 deg. F. Type is set in the printing department and used in making the mats from which rubber plates are made in the vulcanizer. The salvaged holders and sponge bases are then used to complete the job. The cost, including the amortizing of the vulcanizer over a period of two years, and for new rubber, cement, etc. is unbelievably low, approximating about two cents per square inch. The labor cost is nil for these are fill-in chores that take little time, and the employment of additional help has not been necessary.

GRANT PERMISSION TO MAKE VARIOUS OFFICE MACHINES

Permission to produce check-handling, coin-handling, and envelope-handling machines, currency counting machines, postal permit mailing machines, and stamp cancelling machines on WPB-approved orders for the Army, Navy, Maritime Commission and for essential industries, was recently granted by the War Production Board. Each manufacturer also is permitted to produce these office machines in sufficient quantity to maintain an inventory equal to 20 per cent of the dollar value of the same class billed by him during 1941.

At the same time, permission was granted for production of a limited quantity of autographic registers, change-making machines, and shorthand-writing machines. WPB approval of orders for this equipment will not be necessary since control is maintained by limiting production of these machines to a dollar value of not more than 20 per cent of the dollar value of the same class of machinery billed to customers during 1941.

Production of all of these machines has been prohibited, for the past year and a half. Inventories now are exhausted and resumption of production is neces-

sary if requirements are to be met, WPB explained.

Application for WPB approval of orders from essential industries and for export, for check, coin and envelope-handling machines, currency counting machines, postal permit mailing machines and stamp cancelling machines should be submitted on form, WPB-1688, while orders from the Army, Navy and Maritime Commission are approved on WPB 2798.

The action was made effective by an amendment to Order L-54-c, Service Equipment.

LOCKER AND SHELVING ADVISORY COMMITTEE FORMED

Meeting for the first time to discuss future production, the newly formed Locker and Shelving Industry Advisory Group, is one of the four committees organized to replace the Metal Office Furniture IAC. The other three committees which will consult with WPB on metal office furniture, in its closely related groups, are Visible Records Equipment, Safe and Insulated File Equipment and General Office Furniture.

(Continued on page 230)

Wanted, Male

men training wanted by manufacturer to take over business forms. Must have superior business ability for the job. Salary \$4600. Address particulars to Box 941.

to design efficient office forms familiar with all types of business methods and business procedures. Men chosen will have definite future with fast-growing Middle West. Salary \$4600. Address full particulars to Box 720.

EXPERT wanted who will design business forms systems and changes that will aid in a greater volume of work for our present staff. We will constantly keep our systems up to date. Compensation will be permanent. Full particulars as to draft status and salary. Address particulars to Box 336.

FORMS buyer wanted who is familiar with all types of business forms on market today. Must know how to plan systems and design forms to achieve real printing economy. Salary \$4600. Address particulars to Box 941.

MAN with business methods and systems to eliminate waste motions and produce more work with less help. We have a good opportunity for a man who is energetic and will design a single fool-proof business form or install a complete system, whichever you desire. Address particulars to Box 336.

Help Wanted, Male

BUSINESS FORMS buyer wanted who is familiar with all types of business forms on market today. Must know how to plan systems and design forms to achieve real printing economy. Salary \$4600. Address particulars to Box 941.

ARE YOU familiar with all types of business methods and systems to eliminate waste motions and produce more work with less help. We have a good opportunity for a man who is energetic and will design a single fool-proof business form or install a complete system, whichever you desire. Address particulars to Box 336.

JOB wanted who will design business forms systems and changes that will aid in a greater volume of work for our present staff. We will constantly keep our systems up to date. Compensation will be permanent. Full particulars as to draft status and salary. Address particulars to Box 336.

MAN with business methods and systems to eliminate waste motions and produce more work with less help. We have a good opportunity for a man who is energetic and will design a single fool-proof business form or install a complete system, whichever you desire. Address particulars to Box 336.

Help Wanted, Male

EFFICIENCY EXPERT wanted who will survey our present business forms systems and will recommend changes that will aid us in producing a greater volume of clerical work with our present staff. We will constantly keep our systems up to date. Compensation will be permanent. Full particulars as to draft status and salary. Address particulars to Box 336.

Help Wanted, Male

JOB with a bright post-war future. A systems expert who is willing to change now. We have long realized our business forms, methods and systems needed a good overhauling and plan to get this job under way before the war boom starts. Apply by letter to General Manager, Box 706.

OPPORTUNITY for a man with along business forms efficiency lines. Need a young energetic man to help our business methods and system department who has had a background in design and planning experience. Permanent connection with 50-year company. Man applying should be executive type who is not afraid to make drastic changes. We need a "boom" man. If you can meet these requirements, get a letter in the mail today. All replies held strictly confidential. Our employees know of this. Address replies to Box 874.

MAN wanted to design efficient business forms. Must be familiar with all office machines and business methods and procedures. Man chosen will have definite future with fast-growing Middle West. Salary \$4600. Address particulars to Box 720.

EXPERT wanted who will design business forms systems and changes that will aid in a greater volume of work for our present staff. We will constantly keep our systems up to date. Compensation will be permanent. Full particulars as to draft status and salary. Address particulars to Box 336.

MAN with business methods and systems to eliminate waste motions and produce more work with less help. We have a good opportunity for a man who is energetic and will design a single fool-proof business form or install a complete system, whichever you desire. Address particulars to Box 336.

FORMS buyer wanted who is familiar with all types of business forms on market today. Must know how to plan systems and design forms to achieve real printing economy. Salary \$4600. Address particulars to Box 941.

THIS MAN WANTS TO WORK FOR YOU
Salary: FREE



Shake hands with a man with ideas! An energetic fellow who can show you how to speed up your office systems and produce MORE work with LESS help.

What's more important, he'll show you how to save money in planning, printing and executing all types of business forms. Yes, sir, shake hands with the Rediform Systems Engineer!

This man has the "Know-how" that spells greater efficiency and all-around smoother operation for your office. He is familiar with office machines, methods, systems and business procedures. He is trained to instantly detect waste motions and knows how to eliminate them. He will design a single fool-proof business form or install a complete system, whichever you desire.

This man is ready to go to work on your problems and he will make NO CHARGE for his services. His counterpart is to be found in all principal cities. Call him in and show him where you would like to speed up operations . . . then, let him go to work! The single form or complete system that he will present you will save you time, money or both. Call him in today!

REDIFORM

**TIMESAVING BUSINESS FORMS
AND SYSTEMS**

AMERICAN SALES BOOK COMPANY, INC. SUBSIDIARY OF MOORE CORPORATION, LTD. NIAGARA FALLS, N. Y.

*"The Budding Artist"*

When you want to know
GO TO AN EXPERT

It's a PARTICULARLY good idea where you come to the problem of choosing papers. In that case, of course, the expert would be your printer.

See what he has to say about Rising Papers . . . and what they can do for the appearance of your letter. He ought to know. His own reputation for fine work depends largely on the quality of the paper he uses . . . and for years we have furnished these same expert printers with fine papers for every printing purpose.



Prices on a level with other quality papers. Among other lines: Rising Bond (25% rag), Rising Line Marque (25% rag), Finance Bond (50% rag), Rising Parchment (100% rag). The Rising Paper Company, Housatonic, Mass.

ASK YOUR PRINTER—HE KNOWS PAPER

(Continued from page 228)

This new arrangement is in the interests of greater workability.

Purpose of the recent Shelving and Locker meeting was to determine the industry's readiness for normal production when war conditions make some easing of restrictions possible. The chairman emphasized, however, that any immediate reconversion is contrary to WPB's announced policy, and that all discussion must point toward some future date to be determined by the course of the war.

The IAC members, makers of metal shelving and lockers for factory and institutional use, readily accepted the fact that any civilian production must wait for an indefinite period. But they strongly urged that WPB immediately consider the advisability of releasing sufficient steel to allow them to make some proportion of the shelving needed by war plants, and to use metal in shelving for military bases.

It was unanimously agreed by industry representatives that wood shelving, which they now supply for essential industrial and military needs, is not satisfactory to the purchasers although more expensive than metal. "With the necessary hard woods very tight, and steel apparently becoming available, we suggest that WPB permit us a steel quota for shelving to be used in connection with the war effort," IAC members said in effect. The problem of metal lockers was agreed to be less immediate, although it was said that many war plants need them.

Most manufacturers in the shelving and locker field are filling direct war contract, but IAM members reported a decline in rate of orders. Many of them felt it would be possible to resume some normal production during the next 90 days without disturbing manpower conditions even in critical areas.

1 1 1

**DUMPING EXCESS SAFES & FILES
 WOULD CAUSE UNEMPLOYMENT**

Members of the Safes and Insulated Files Industrial Advisory Committee, War Production Board, recommended at a recent meeting that excess inventories of safes and insulated files held by government agencies be withheld from the market for a period of 18 months or two years after the end of the war. If this is not done, they said, they would not be able to operate their factories, and the resulting unemployment would be serious.

A great need for safes and insulated files in business and industry has resulted from increases in the number of records of all types that have been kept in recent years—records on production, materials, equipment, procurement, payroll deductions, and the like. However, the members said that when production is resumed the industry will have to start from scratch as far as materials are concerned, as inventories of raw materials and semi-fabricated parts have been used in filling priority orders.

Of the materials required for production of safes and files, steel will be needed

(Continued on page 232)

**Just a piece
of paper...**

Executive Mansion
Oct 17, 1861
Major Ramsey
My dear Sir
The lady - heard of
this - says she has two sons.
who want to write - Set them
at it, if possible - Wanting
to write is so rare a merit,
that it should be encouraged
Yours truly
A. Lincoln

but the signature makes it valuable

THE PAPER that we use for DAWN carbon is "tops" in carbon paper quality but it is the name that makes it really valuable. The name DAWN on a carbon sheet signifies the best of everything — materials, workmanship, research.

That's why DAWN is the peer of carbons . . . why it's in a class all by itself when it comes to quality . . . why it has no equal for saving time, waste and money.

DAWN is the carbon that will not *Curl*

**Dawn gives you FLEXIBILITY—PERMANENT CLEAR COPIES —
EASY HANDLING—CLEAN ERASURES—SHARP IMPRESSIONS**



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Foremost Makers of Ribbons and Carbons for Every Use

750 PACIFIC STREET, BROOKLYN 17 NEW YORK, N. Y.



Old Town makes outstanding inked ribbons and carbon papers for every conceivable use.

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NEAPOLIS · ST. LOUIS · BUFFALO · DETROIT · NEW ORLEANS · BIRMINGHAM · MEMPHIS · ATLANTA · HOUSTON · DENVER



you're looking for better and faster ways of Record Keeping

Find the Answer In **CESCO** VISIBLE RECORD BOOKS

THESE BOOKS are fast operating, compact and portable. They provide instant reference. Exact information for proper control is readily obtainable. That is why the country's largest organizations—particularly in war industries—have installed this equipment.

Here are some records which are particularly adaptable to CESCO Visible Record Books:

**SALES & PROSPECTS
PURCHASE & QUOTATION
PARTS RECORDS
COST & PRODUCTION**

**INVENTORY & STOCK CONTROL
ADVERTISING RECORDS
ACCOUNTS RECEIVABLE & PAYABLE
CREDIT & COLLECTION**

Stock Forms for most of the above — over 100 in all — available for immediate shipment. Any form made to order on short notice. For complete information on CESCO Visible Record Books ask for Catalog "G".

Also Worthwhile To Inquire About

Social Security and Pay-Roll Records

Newly designed forms for most every line of business. Personnel, Period Pay-Roll and Individual Earning Records. One-time carbonized writing systems. Ask for Catalog "K".

Binder Equipment

A complete range of loose-leaf devices for current and transfer work. Sectional and Solid Post Binders, Prong Binders, Ring Books, etc. Ask for General Binder catalog.

Peg Boards and Shingled Forms

For statistical reports, daily orders, sales, etc. Provides automatic totals. Forms for Peg Boards or Multiple Prong Binders. Ask for Booklet No. 501-S.

Special Printing

Our unusual facilities for office and factory forms insure perfect registration, punching and trimming. Also advertising printing—circulars, price lists, etc. Get our prices.

Write for Information NOW

Ask for the literature in which you are interested. Or tell us about any record-keeping problem you may have—perhaps we can help you. No obligation.

The C. E. SHEPPARD CO.

4405 Twenty-First Street
LONG ISLAND CITY 1, N. Y.



(Continued from page 230)

in the largest quantity. It is also the most readily available. Only an extremely small amount of copper will be needed. The use of other critical materials has been largely discontinued for some time.

It was pointed out that the facilities needed to make safes and files are on hand and ready for use at any time. As a result of recent cancellations of war contracts held by the industry, manpower is also generally available at present provided it is not needed in other war industries.

WPB limitations on sizes of safes would be unnecessary, industry members contended, since limitations on materials would automatically force manufacturers to save materials and man-hours by producing a minimum number of sizes. Furthermore, simplification of sizes and grades of safes has already been achieved through the setting up of specifications by the Fire Underwriters and the National Bureau of Standards.

Members of this committee are:

Stanley R. Akers, Meilink Steel Safe Co., Toledo, Ohio;

E. V. Flaherty, Herring-Hall-Marvin Safe Co., Hamilton, Ohio;

Harry H. Lynn, The Mosler Safe Co., Hamilton, Ohio;

C. E. Mann, The Schwab Safe Co., Lafayette, Ind.;

T. E. Miller, The Shaw-Walker Co., New York, N. Y.;

A. J. Roos, Diebold, Inc., Canton, Ohio;

Al. N. Seares, Remington Rand, Inc., Buffalo, N. Y.;

I. Laucks Xanders, York Safe & Lock Co., Baltimore, Md.

CONTROLLED MATERIALS FOR PAPER AND PAPERBOARD MACHINERY

Manufacturers of paper and paperboard mill machinery and fibre-box making equipment will be allocated certain amounts of controlled materials—steel, copper and aluminum—upon application to the War Production Board, members of the Containerboard and Fibre Box Industry Advisory Committee were advised by WPB officials at a recent meeting in Washington. The amount of materials that the Requirements Committee of WPB has agreed to allocate for this purpose will approximate pre-war requirements, and probably equal the total received during 1942 and 1943, WPB said.

The materials will be distributed proportionally to those producers of mill equipment who have available facilities to manufacture additional civilian equipment of this type, according to Allan Hyer, of the WPB Paper and Paperboard Divisions. He said, however, that deliveries under AA-3 priorities might be slow because of continuing war orders. Any new equipment manufactured will be allocated to producers of container and fibre board who can increase their production, it was explained.

If any increase in United States paper production is possible, it should be con-

(Continued on page 234)



"Let's See—Where Did We Put That Jones Shipment?"

Poor Witherspoon! Finding a needle in a haystack is easy, compared with *his* job!

With the proper records, he'd locate that part in jig time. For, in any plant—or business—records help management keep tab on every order, every item, in every stage of its progress.

That's why thousands of businesses, in these days of higher wages and scarce help, use Uarco records—tool orders, tracer forms, production and material requisitions, work orders, inspection reports—to keep the work moving in an orderly, routinized way.

Uarco has developed ways to make every business

operation faster, more efficient, more accurate, through the use of better records, whether you use handwritten (autographic register) records or continuous type-written forms.

It may be that you have a special record problem. Uarco representatives will gladly consult with you in order to devise new and better time-saving forms. Put Uarco's years of experience to work for you in achieving new and important economies.

UNITED AUTOGRAPHIC REGISTER COMPANY
Chicago, Cleveland, Oakland • *Offices in All Principal Cities*



AUTOGRAPHIC REGISTERS



FORMS FOR
HANDWRITTEN RECORDS



FORMS FOR
TYPEWRITTEN RECORDS



FORMS FOR
BUSINESS MACHINE RECORDS



UARCO

BETTER BUSINESS RECORDS



Alert Purchasing Executives See the Many Needs for Photo-Copies

All departments need photo-exact copies of letters, bids, contracts, orders, financial data, work sheets, blueprints and other important papers. Alert purchasing executives quickly visualize a hundred uses for the versatile A-PE-CO Photo-Copier and recommend its use. They realize the many advantages of Photo-Copier original copies, sending easy-to-read photo-copies to other departments and branches. Any inexperienced girl or boy makes A-PE-CO photo-copies quickly of anything written, printed, drawn or photographed. No technical training needed. The A-PE-CO Photo-Copier is endorsed by thousands of American business leaders and is used in many departments of government. Get this new business habit! Write TODAY for folder of A-PE-CO uses in every department of YOUR business.

A-PE-CO
"Photo Exact"
COPIES MADE FAST
BY ANYONE, ANYTIME

PHOTO-COPYER
\$5500
COPIES UP TO
18" x 22"

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PHOTOCOPY
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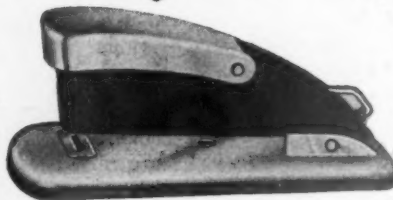
Everyday all
over America

**Parsons
Paper**
*Specialized for
Modern Business*

— is stepping up production. Faster and better paper work is being turned out because these quality papers increase clerical efficiency.

STAR Stapler

THE
BEST WAY
TO FASTEN
PAPERS



Star Staplers are needed on every desk. They use less steel to fasten papers than other methods of fastening. They are built to last and are guaranteed against defects. Essential industries can still be supplied. Model S 122 A shown above lists for only \$1.90. Write for Catalog.

He'll get your letter without fail
If you will send it by V-MAIL

STAR ★ **PAPER FASTENER CO.**

DEPT P., NORWALK, CONN.

(Continued from page 232)

fined to the production of additional containerboard, G. G. Otto, director of the WPB Paperboard Division, said. The demand for paperboard suitable for making fibre containers is so great, Mr. Otto emphasized, that the industry should make every effort to increase production of that type of paperboard.

Corrugated requirements for the second quarter of 1944 were estimated as about the same as for the first quarter by W. L. Davis, of the Paperboard Division, who reported that estimated production would be approximately the same.

The Paperboard Division is studying "furnishes," the mixtures of the several materials from which paper is made, to ascertain what additional economies can be effected to save virgin pulp by reducing the richness of the mixtures, he said.

PAPER DIVISIONS TRANSFERRED

The War Production Board Grocery and Variety Bag Section and the Paper Shipping Sack Section, together with the personnel of each, have been transferred from the Containers Division to the Paper Division of the Forest Products Bureau, according to Harold Boeschstein, Acting Director of the Bureau. Both sections will be segments of the Converted Paper Products Branch of the Paper Division.

CRITICAL PERIOD FOR PULP & PAPER INDUSTRY

The transportation facilities of pulp, paper and paperboard manufacturers are being heavily taxed and the months ahead will be an extremely critical period for the whole industry, according to F. E. Hufford, transportation consultant of the War Production Board Forest Products Bureau. The present situation affects both the railway and truck transportation problems, he added, pointing out that the close cooperation of all elements is essential to obtain maximum conservation in pulp, paper and paperboard transportation.

Members of the Paper and Paperboard Industry Transportation Advisory Committee were told that the freight load is increasing and the railroads are confronted with growing manpower shortages as well as a tightening car supply situation. Mr. Hufford added that car shortages, especially affecting the South and Southeast, are increasing daily. Some production has been lost as a result of inability to get sufficient cars for the movement of raw materials and the finished products.

The paper and paperboard industry is dependent to a great extent on truck transportation, as 90 per cent of the pulpwood in the United States moves at least part of the distance from stump to mill on trucks. In the South, where 44 per cent of all United States pulpwood is produced, the entire movement is by trucks, Mr. Hufford said. A recent survey by the Pulpwood Branch of

(Continued on page 236)

My dear Son: Yours by Mr. Marsh was duly received. I am happy to hear that you are all in good health at home and that you are getting along so well in the mill. I don't know but that you will do better without me than when I am at home. I am not disappointed, for I expected that you would do well, your interest in the business already matching mine and your skill at paper-making the equal of men many years senior to you in the craft. Keep P. & V. well supplied with such paper as they may need and try to sell them the Folio Post.

I think if I had some of the blue thick Cap, the No. 2 thick and thin, and the blue demi here that I could sell it to good advantage. Let me know how soon you could send me a load and, if I should conclude to have it sent, it could come to Worcester on a sleigh and thence by the rail-road. I will try to get some rags and send to Worcester to load the team back.

I forgot to pay my taxes before I came away. You must pay them before the second thirty days run out.

I had a letter written to send by Mr. Marsh, but was so long detained at the House the day he left that I did not see him, so this will come by the post-rider. But Dalton will be linked to Boston by the rail-road before long, if Governor Everett's proposal of a grant to aid in its westward extension is approved by the General Court.

Remember me to your brother and all the family and tell your mother that I shall probably not return under two or three weeks, if my health continues good. Take good care of the fires and make yourselves as comfortable as you can.

Yours etc.,

Boston, Massachusetts, 14 January 1837

ZENAS CRANE



Crane's Fine Papers no longer bear the quaint designations of "blue thick Cap" and "blue demi," but they own an unbroken kinship to them in that they are made today — as then — from cotton and linen fibres only. These enduring materials, and the experience of five generations, continue to yield papers of the utmost quality and durability for letters, documents of record, tokens of value, and for many war-time needs and purposes, chief among them the War Bonds we buy in the aid of our country and for our future freedom and security.

CRANE'S FINE PAPERS • MADE IN DALTON, MASSACHUSETTS • SINCE 1801

*"If this is Taxes,
gimme Death..."*



Bill just meant to be funny, but the Old Man didn't take it that way. After all the nightwork and pressure, Bill looked like a close candidate for a casket. And head accountants like Bill didn't bounce out of every business college. With taxes, group insurance, war bonds, hospitalization fees, and union dues making every paycheck a jigsaw puzzle, the payrolls were bad enough. But in paying off Mr. Whiskers every ninety days... filing Victory taxes and Social Security for thirteen weeks, with extra overtime, shift changes and worker turnover... and balancing gross payrolls for the period—Bill pretty near blew his top...

So THE NEXT week a McBee man came around and went into a huddle with Bill. Later on, he came back with some suggestions that made Bill's eyes

pop. A little savvy, specially designed Keysort cards and Waxspot forms that eliminate copying... made the odd amount due to Uncle Sam on each paycheck a simple adding machine chore at the end of the quarter. Bill says he believes in Santy Claus again... Big Admission for an accountant!

McBee methods simplify, speed up and short-cut records and reports... are easy to understand, usable by ordinary office people and require no special skill, machinery or expensive installation. Custom fitted to your own business, McBee methods save time, work, worry, usually reduce clerical expense... are invaluable in these days of office personnel shortage. If you want faster business information, you want to see a McBee man.



THE McBEE COMPANY

SOLE MANUFACTURERS OF KEYSORT

295 Madison Avenue, New York 17, N. Y. . . . Offices in principal cities

(Continued from page 234)

WPB's Paper Division of trucks needed for pulpwood operations this year indicates that the industry will probably require approximately 6,300 medium-sized trucks, a large portion during the early part of this year. Taking into consideration the new truck program and the number in the civilian pool, Mr. Hufford said there would not be sufficient new trucks available this year to take care of all needs, and that the paper industry must conserve every available truck.

PREWAR PAPER STANDARDS OUT FOR THE DURATION

Prewar standards of quality and appearance of paper are "out" for the duration, declared Rex W. Hovey, director of the WPB Paper Division, at recent meeting of the Paper Industrial Advisory Committee. To meet present abnormal demands, manufacturers must produce the greatest quantity of usable paper possible. "The answer," he said, "is simplification of grades and the use of more waste paper, substitute fiber and mineral. Only a small list of highly specialized technical papers for certain uses are exempt from the above."

Edward R. Gay, Office of Civilian Requirements, stated that in effecting equitable distribution of paper and paper-board, coarse paper presents greater difficulty than fine paper, largely because the latter is generally more all-purpose in end use.

Some mills have already stopped making certain grades of paper, and we know of no way to make them resume production, Mr. Gay said. WPB is reluctant to issue directives to that end, since the normal distribution system might be disrupted and the need for administrative controls would be increased. Such action would approach "allocation" of paper to end uses—something which has been avoided thus far. There isn't enough pulp to go around, it was asserted, and mills will have to utilize more waste paper and groundwood and filler.

A task committee consisting of the following: Mr. A. B. Leslie, John Leslie Paper Company, Minneapolis, Minnesota; Mr. N. A. Altmann, Butler Paper Company, Chicago; Illinois; and Mr. W. M. Stetson, Storrs-Bement Co., Boston, Mass., were appointed to investigate and prepare reports and recommendations on the proposed revision of Order L-120.

STATIONERY AND TABLET INDUSTRY COMMITTEE FORMED

The Office of Industry Advisory Committees of the War Production Board announced the formation of the Paper Stationery and Tablet Industry Advisory Committee. Leonard F. Smith of the WPB Paper Division has been appointed government presiding officer.

Members of the committee are:

Ronald Astley, Highland Mfg. Co., Holyoke, Mass.; C. L. Clayson, Eaton Paper Corp., Pittsfield, Mass.; H. C. Dutton, White & Wyckoff Mfg. Co.,

(Continued on page 238)

A new study of EFFICIENT PURCHASING PROCEDURE

READ THESE CHAPTER HEADINGS

Purchasing Department Functions
Initiating the Purchase
Quotations—Price Analysis
Index of Vendors
The Purchase Order
The Pending File
Order Follow-Up
Commodity Purchase Record
Vendor's Purchase Record
Make and Hold Records

and other
important
subjects

**offered to you
in this 64-page illustrated book...**

HOW TO CONTROL buying with a minimum waste of purchasing executive time . . .

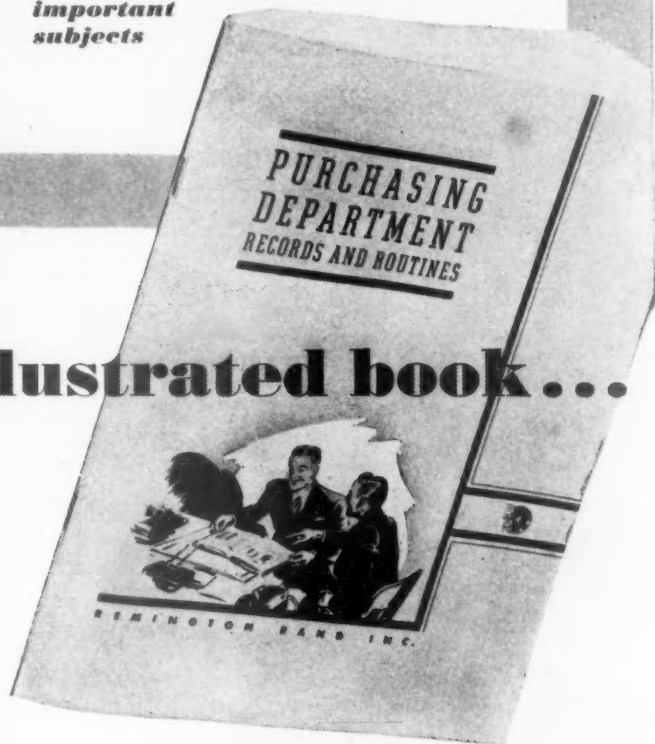
HOW TO BUY in proper volume without the danger of overstocking or understocking . . .

HOW TO KNOW where you can buy and be certain of delivery when you want it . . .

HOW TO DO all this under present conditions and those which promise to hold in the future is the subject of "Purchasing Department Records and Routines."

This new book, just off the press, has been prepared on the basis of a study of current operating procedure in the purchasing offices of nationally famous organizations. It is a thorough-going analysis that digs deep into the current problems of the purchasing executive. It shows in clear detail the vital function of properly designed and coordinated records, with illustrations of actual forms that have proven effective in actual use, that are easy to maintain and that eliminate waste. Based on new research, this study summarizes *helpfully* the war-time experience of leading Purchasing Executives.

To get your free copy, write, phone or wire our nearest Branch Office for "Purchasing Department Records and Routines." Or use this handy coupon.



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**SYSTEMS DIVISION
REMINGTON RAND
BUFFALO 3, NEW YORK**

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ACE

THE STANDARD BY WHICH *all Staplers* ARE JUDGED

THE production of Ace Stapling Equipment has been devoted to the most essential war requirements for the past two years. Abnormally heavy Government requisitions, during this time, which had to be given preference, absorbed the great portion of our allotment. These conditions have proved a decided handicap in supplying stapling equipment to our regular commercial accounts. *This tension is gradually easing up!* We anticipate that there will be available, in the near future, more and more Ace Stapling Equipment.



ACE'S WARTIME MODEL
No. 402-V

Ace Staplers have always commanded the respect and confidence of Purchasing Agents everywhere. These men know, from past experience, just how dependable these finely built machines are... how long and satisfactorily they serve their owners. Ace Staplers continue to be the quality standard by which all others are judged.

SOLD THROUGH DEALERS EXCLUSIVELY

ACE FASTENER CORPORATION
3415 North Ashland Ave., Chicago 13, Ill.



(Continued from page 236)

Holyoke, Mass.; R. J. Flagg, Eastern Tablet Corp., Albany, N. Y.; Harry Garey, Montag Brothers, Inc., Atlanta, Ga.; D. A. Heffner, Central Tablet Mfg. Co., Columbus, Ohio; John P. Leindecker, Western Tablet & Stationery Corp., Dayton, Ohio; Lloyd Riches, Western Paper Converting Co., Salem, Ore.; J. T. Roach, Southern Central Co., Memphis, Tenn.; E. G. Spatz, Roaring Spring Blank Book Co., New York, N. Y.; and R. O. Spencer, Osborn Paper Co., Marion, Ind.

CONTROL BOARDS HOLD REMOVABLE STRIPS

Announcement is made by Acme Visible Records, Inc., 122 So. Michigan Ave., Chicago, Ill., of the development of a new line of control boards for use with Acme Flexoline control strips in a visible record assembly. The boards are made in 1, 2 and 5 column units for strips measuring 6 and 8 inches in width,



New Control Board Developed
by Acme Visible Records

in 1 and 2 column units for 10 inch strips. The Flexoline strips are supplied in sheets and rolls to be typed or printed and then snapped apart for application in the boards. Strip height is 1/6, 1/4 or 1/3 inch. One column will hold 100 of the 1/4 inch strips. This visual control is described in detail in 8-page booklet "Acme Visible Production Control Systems."

CIRCULAR SLIDE RULE SIX INCHES DIAMETER

Slide rule with scales on a disc six inches in diameter, with length of multiplication, division scale 13.8 inches, known as the Monitor Circular slide rule, is announced by Tavella Sales Co., New York 7, N. Y. Multiplication, division, square root and problems involving the use of logarithms and functions of angles are easily solved with the rule. The front side has 4 scales, Log, C, D, and C1 or C inverted scale. The reverse side has sine and tangent scales and A and D scale for finding squares and square roots. Scales are finely graduated on

white vinylite plastic, accurately ruled and are guaranteed to last for years. The rule is said to be grease-and water-proof.

PEN & PENCIL SET COSTS \$12,000— CHINESE

"Because of the scarcity of goods, prices are fantastic in China," writes Larry Martin, former Industrial Salesman, Scot Paper Company, in letter published in the company's house organ *Scottissue Broadcast*. Martin is now a First Lieutenant with the Armed forces in the Far East. Continuing, his letter states: An American pen and pencil set costs around \$12,000 (Chinese), or around \$125 in our money. You can bet that we buy very little, for all prices are in the same proportion.

"China, as you know, has serious inflation. The legal rate is still 20 to 1 for good old U. S. dollars. However, on the black market it fluctuates from 70 to 1 to 100 to 1. And by 'black market' I don't mean covered up operations. You can walk along the street in a nearby town and you will be approached about a dozen times per block and asked if you want to buy 'CN,' which is what they call their yuan or dollar. It isn't unusual to see a man with his pockets jammed with them, and then bundles of them in his arms."

GREASE RESISTANT PAPER

In order to render paper resistant to grease, E. D. Rich, in U. S. patent 2,317,696, specifies that the paper first be coated with an aqueous solution containing 5-20 per cent of a chlorinated or other reduced viscosity starch, 1-10 per cent of glycerine, and 0.5-2 per cent of a water-soluble methyl ether of cellulose. The paper is dried and then coated on the same side with an aqueous solution containing 1-10 per cent of a water soluble methyl ether of cellulose and 1-5 per cent glycerine. The drying is repeated. The glycerine serves a dual role. It maintains the flexibility of the paper and its coating, and being immiscible with many greases, oils and fatty materials, often helps as a barrier material.

LIMITATIONS ON FURNITURE PATTERNS REMAINS IN EFFECT

Wood furniture manufacturers, previously permitted to make only certain types of furniture, now may produce any type they wish, but the previous limitations on patterns and on lumber consumption for furniture remain in effect, the War Production Board announces.

The wood furniture order (L-260-a, issued December 4, 1943) in Schedule A listed specific types of home, office, and institutional furniture which could be made. This listing has been deleted in the present amendment in order to facilitate administration of the order.

Because of the shortage of lumber, however, it is still highly desirable that

(Continued on page 240)

INTERNATIONAL COOPERATION

*Fighting Shoulder to Shoulder in INDIA*

Bombers over Burma...and Yanks, British and Indians sweating, straining to keep 'em flying. Differences of race, creed, and color are lost in something far greater:

INTERNATIONAL COOPERATION to gain the victory—and win the peace.

Farm boy, shop worker, Ivy Leaguer—but every one a Yank. A long way from home but right at home helping the other

fellow...Yankee know-how, grit and good nature to spare.

The dislocations caused by war introduce many problems into the production—and buying—of paper. International aims, to the best of its ability, to cooperate in solving these problems.

★ BUY ANOTHER WAR BOND ★

International



PAPER COMPANY

220 E. 42nd ST., NEW YORK 17, N. Y.

PAPERS FOR PRINTING AND CONVERTING



I'm Mickey, the Microbe
— A tough little twirp —
From cup lips to your lips I caper
So very prolific
They call me terrific
But I'm licked when the cup's
made of paper!

AJAX ▶
Paper Cups



◀ **AERO**
Paper Cups

COLUMBIAN ▶
Paper Cups



◀ **PEERLESS**
Paper Cups

USE PAPER CUPS

LOGAN DRINKING CUP COMPANY
68 Prescott Street, Worcester 5, Mass.

PACIFIC COAST ENVELOPE COMPANY
416 Second Street, San Francisco 7, Calif.



Divisions of
UNITED STATES
ENVELOPE CO.

13 Plants from Coast to Coast

(Continued from page 238)

manufacturers concentrate on production of the most essential types of furniture.

The use of wood for furniture is still restricted to 84 per cent of the board footage of lumber that manufacturers used for furniture and crating in 1943. The use of certain particularly scarce species of wood also continues to be limited under the same order.

As before, also, each furniture manufacturer may make at any one time only 35 per cent as many patterns as he offered in September, 1941, or 24 patterns in all, whichever is greater (under L-260, as amended January 14, 1944).

THE OUTLOOK FOR PAPER

Last year was a good one for paper merchants and mills, states the Strathmore Paper Company. In general this year to date has been the same. Yet problems are multiplying: The mill inventories which served as a cushion in 1943 are largely gone. Paper merchants' inventories are lower and being reduced further month by month. But some consumer inventories are still sizable, due to advance buying. Such inventories may help relieve today's situation since these companies may not be in the market for paper until present supplies are used.

Meanwhile, the shortage of pulp continues. If farmers and war prisoners cut more wood, the present trend of declining pulp supply may be reversed. But it is probably too much to expect any substantial increase in pulp production, therefore in paper production.

Fortunately the reduction in weights of paper allows present pulp and other materials to be made into the maximum area of paper. It seems likely that there will be paper for essential uses but economy will be the watchword. And based on all apparent conditions at the present time, it can be assumed that demand for paper will exceed supply during 1944.

All mills are loaded with orders and this condition seems likely to continue. So deliveries in 1944 will probably be no quicker than in 1943.

80% OF GUMMED PAPER IN WAR AND ESSENTIAL USES

More than 80 per cent of the gummed tape and flat gummed paper produced in this country is going into war and other essential uses. G. E. McCorison, Chief of the Waterproof Paper and Gummed Tape Section of the War Production Board Paper Division, told members of the WPB Gummed Tape Industry Advisory Committee at a recent meeting in Washington.

More than half of the current production of gummed paper and tape is used by government agencies and in war plants and a large part of the balance by the processors of agricultural and chemical products, Mr. McCorison said.

Raw material shortages, including base papers, adhesives and cloth backing, were discussed by the committee, which found dextrin adhesives in ample supply, but animal glue and extracted bone glue

were reported as short. Kraft paper continues in short supply and the shortage will not improve in the near future, the representatives found.

The large requirements of flat gummed paper used by the Office of Price Administration for pasting up gas coupons, aggregating between 1,500 and 1,800 tons a year, were discussed, and a program designed to meet emergency supply requirements was recommended. Task committees were designated to study conservation problems, material requirements and the scheduling of production according to essential uses.

"THIS PAPER CRISIS IS YOUR CRISIS"

"Overcome any idea you have that the shortage of pulp and paper is merely the bad luck of the paper industry! Deprived of pulp and paper, America could lose this war in no time! And that would affect You and everybody else! Pulp is essential in the making of explosives, rayon parachutes, surgical dressings. The by-product tannic acid is essential to leather tanning. Paper is critical material for packing food for our fighting men, for wrapping sulfa drugs, blood plasma and medicines, gun and replacement parts. Without it, too, civilian goods could not be packaged and shipped. Thousands of men are leaving the woods for military service and for high wages paid by war plants. Reserve supplies in

(Continued on page 242)

A GOOD PAPER MILL CONNECTION

"United Nations" — 25% Rag
Content Bond

"Britteness" No. 1 Bond

"Waterfalls" No. 2 Bond

"Waterfalls Extra Fine Laid"
No. 2 Papeterie

"Britteness" No. 2 Offset

"Britteness" No. 2 Manifold

Rag Onion Skin

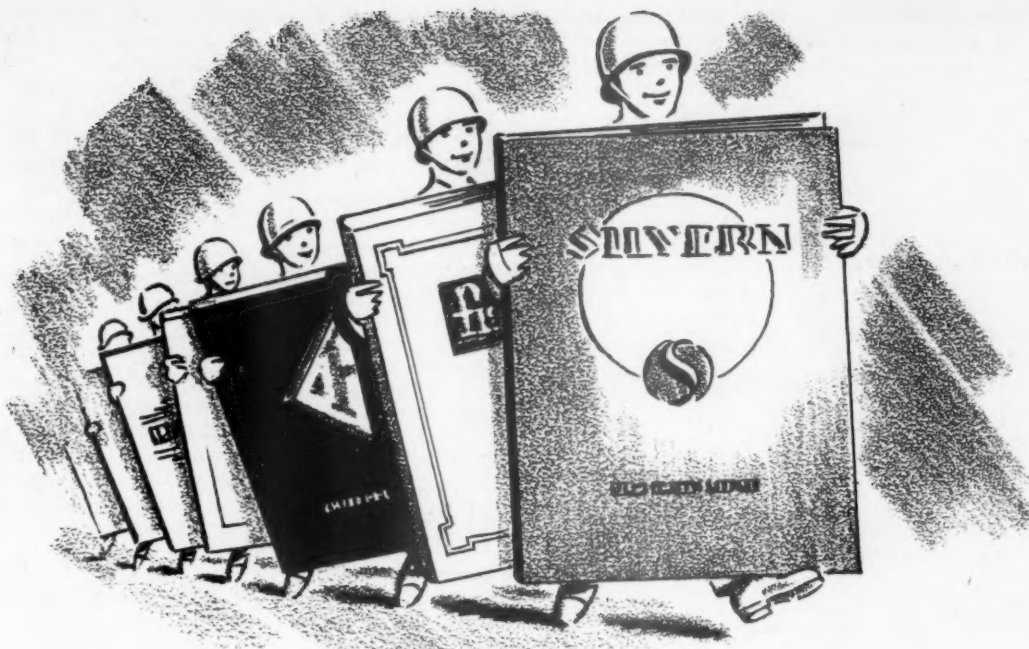
No. 2 Index

Tissue and Specialties

Sold Thru Established Paper Merchants

**NORTH AMERICAN
PULP AND PAPER
CORPORATION**

Cheboygan, Michigan



When your catalog comes marching back...

... will it be **LOOSE LEAF**? Perhaps not, if you wait until it's on top of you ... clamoring for last-minute action ... hamstrung by hurry, confusion, makeshifts. Prepare for it **NOW** ... be ready ... have it all planned and fit to go out and fight for sales ... the *modern*, efficient **LOOSE LEAF** way.

LOOSE LEAF has several outstanding advantages ... among them ...

- ★ **AMPLE ROOM FOR FUTURE EXPANSION** most important in new postwar catalogs, which may start small and grow fast.
- ★ **EASY ADDITION AND REMOVAL OF PAGES** ... keeps up-to-the-minute on changes in merchandise and prices.
- ★ **IDEAL FOR INDEXING** ... more necessary than ever in days to come for instant reference and quick finding of data.
- ★ **CONVENIENCE OF OPENING** ... sheets lie flat for quick easy reading.



If catalogs are needed in your business, talk to your sales and advertising men and see that they are planned the **LOOSE LEAF** way. Good judgment says do it now. And feel free to write us for further information.

NATIONAL BLANK BOOK COMPANY

ENGINEERS AND MAKERS OF LOOSE LEAF COVERS

HOLYOKE, MASSACHUSETTS

NEW YORK

CHICAGO

BOSTON

SAN FRANCISCO

(Continued from page 240)

wood yards already are exhausted. Mills operate short time. Paper stocks dwindle. The effect of all this soon will be felt on every front, unless the seriousness of the situation is recognized and the trouble corrected. This crisis is your crisis. Wire your representatives and senators today and urge action to assure the uninterrupted flow of pulp-wood!" Champion Paper & Fibre Co.

WASTEPAPER—NO. 1 SALVAGE PROBLEM

During the last six months of 1943 the armed services and Government agencies salvaged more than 74,000 tons of wastepaper and obsolete records and printed matter at a cash recovery to the Government of almost \$1,200,000, according to joint statement issued by the Bureau of the Budget and the War Production Board.

Among the Government units contributing to the large volume of wastepaper salvaged in the second half of last year, the War Department alone turned in an estimated 45,000 tons. The Procurement Division of the Treasury Department was second with 12,893 tons; Navy Department, 9,500 tons; the Government Printing Office, 5,643.

The War Production Board, which has spearheaded the national wastepaper collection drive, terms this our No. 1 salvage problem, now more urgent than any

other, with kraft paper the most critical because of the armed services' expanded use of paper packaging.

ZINC AVAILABLE FOR PENCILS AND COATING

Mechanical pencils and protective coating or plating of zinc on loose leaf metal parts and units, are included in the list of products for which the War Production Board has restored the use of zinc. The restoration was effected by amending Conservation Order M-11-b. End product volume and other restrictions on manufacture still remain under the controls set up by the many "L" orders under which they are produced. The list also includes coal stokers, electric ranges, dry cell batteries, portable electric lights, electric fans and motorized fire apparatus.

URGE CONSERVATION OF ENVELOPE CONTAINERS

All manufacturers of envelopes were urged to adopt every possible measure to conserve the use of shipping containers by Leonard F. Smith, chief of the WPB Stationery Section. This action was recommended by the Envelope Industry Advisory Committee at its meeting in Washington, D. C.

Such conservation measures would include the elimination of shipping containers for all local deliveries, the use of shipping cartons or boxes, but not both,

in all possible instances, and a diligent campaign to bring about the return to the manufacturer by the user of all usable cartons, Mr. Smith said.

The committee also urged all manufacturers to promote and advocate the use of the lightest weights of envelope paper possible, dependent upon the functions the envelope has to serve.

HECTOGRAPH INK STAIN REMOVER

A cleansing cream named Pax Cleansing Cream is announced by the G. H. Packwood Manufacturing Co., 2038 Walnut St., St. Louis, Mo., as a detergent for the removal of hectograph ink stains. Its ink-solvents become active at body temperature, according to the manufacturer, making for easy, quick removal of stains. Pax is pink in color and delicately scented.

EIGHT-PAGE METHODS BULLETIN

The Visible Index Corp., 535 Fifth Avenue, New York, is preparing an elaborate eight-page "Methods Bulletin" called Visirecord Methods Reporter, in two colors, which shows a novel application of graphs and charts to visible records. The product, Visirecord, has visible margins up to 36 square inches and more, permitting all the known principles of charting and graphing to be applied to the visible margins of record

(Continued on page 244)

it takes a Fine pencil to produce a Fine job



It is emphasizing the toughness, yet finer qualities of KOH-I-NOOR Drawing PENCILS. Behind the lines—in the drafting rooms—reports repeatedly tell of KOH-I-NOOR'S ability to "stand the gaff" of high-speed planning.

And no wonder! For KOH-I-NOOR Drawing PENCILS have been the accepted standard of quality for over 50 years. Available in 17 dependable degrees, they give you lines—crisp, sharp and opaque—the logical combination for legible blueprints. And should you want soft, modulated tones for comprehensive renderings, you'll find the right degree in KOH-I-NOOR.

Send for Leaflet No. 11



The RIGHT pencil for the RIGHT job

KOH-I-NOOR PENCIL COMPANY, INC., BLOOMSBURY, NEW JERSEY

FINE DIAMONDS

Since 1912 we have been direct importers of fine diamonds. Our values are outstanding. Selections sent for inspection without obligation.



L. & C. MAYERS CO.

ESTABLISHED 1912

Importers of Diamonds and Watches
Distributors of Jewelry, Silverware,
Luggage and Giftwares

545 FIFTH AVENUE
NEW YORK

If you ask me...

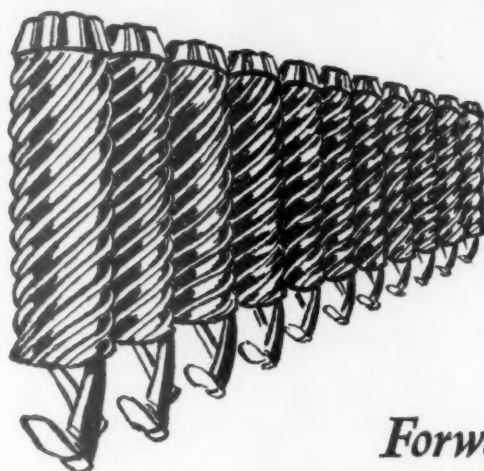


ANY OFFICE USING
IMPERIAL
FILING SUPPLIES

is "Sitting Pretty!"

Smart business girls quickly recognize the PLUS QUALITIES of Imperial Filing Supplies. They are also mindful of the fact that YOU get these refinements at no extra cost. So give your office the best in filing supplies . . . ask for IMPERIAL the next time you buy.

Your STATIONER will supply your needs.

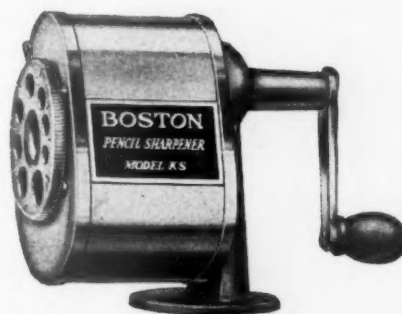


Forward

MARCH! *The* **BOSTON** Cutter Brigade

Get in step with the times by saving steel and man power — You can keep your sharpeners in pointing trim by installing NEW CUTTERS. Circular is ready giving simple instructions for installing cutters.

Send for yours today.



BOSTON
PENCIL SHARPENERS

C. HOWARD HUNT PEN CO.

CAMDEN, N. J.

SPEEDBALL PENS--HUNT PENS



Take the "FISH" out of your Letterhead Handshake!

YOU remember a firm and friendly handclasp. To stand out, your letters must convey the same sincere greeting. Have you looked at your letterhead lately? . . . is it flimsier? . . . is it grayer? Then turn to *Anniversary Bond*! Made 100% from non-critical, clean, new *all-rag* cuttings — unaffected in color by the chemical shortages caused by war — *Anniversary Bond* is the

one kind of paper as crisp, as brilliant looking and as permanent as ever. You spend dollars of time on what you write . . . spend only a fraction of a cent more to *make* it right.



FREE Comparison Kit
Visual proof, with samples, that *all-rag Anniversary Bond* is the paper for you to sign—printed, lithographed or engraved. Please request on business letterhead.

SPEND 1/3 MORE

Masterline

FOX RIVER PAPER CORPORATION
403 South Appleton Street, Appleton, Wis.

SPECIFY ANNIVERSARY BOND

THE BEST LETTERHEAD PAPER IS MADE FROM ^VRAGS _{all}

THIN PAPERS
Reduce
TYPING, MAILING
and FILING COSTS
Specify one of
ESLEECK
THIN PAPERS
Ideal for Air Mail, Branch
Office and Foreign
correspondence.
ESLEECK MANUFACTURING COMPANY
TURNERS FALLS, MASSACHUSETTS

TYPEWRITER RIBBONS
THAT WEAR LONGER
For any make of typewriter

Cost You Less Through Burroughs Discount Purchase Plans
Burroughs ribbons are manufactured from fine fabrics and inks, to exacting specifications determined by Burroughs' years of experience in the business machine field. A range of colors and color combinations for all makes of typewriters, as well as for other types of business machines. Save 10% to 40% on your various ribbon costs through Burroughs Discount Purchase Plans. Call your local Burroughs office for complete details, or write Burroughs Adding Machine Company, Detroit 32, Michigan.

Burroughs
SUPPLIES FOR BUSINESS MACHINES

(Continued from page 202)
cards. Copy of "Graphs and Charts" is available on request.

WPB-OPA DIGEST

Certain Paper Contracts Firmed—WPB
—Henceforth, Army, like Navy and Procurement Division of Treasury Department, will buy paper on firm contract, ninety-day basis.

Paper Machinery Problems—WPB
Manufacturers of paper and paperboard mill machinery and fibre-box making equipment will be allocated certain amounts of controlled materials—steel, copper and aluminum—upon application to WPB.

Paper Pricing Modified—OPA—Removal of three types of sales from regulation providing ceiling prices for fine papers and certain paperboards at merchant or wholesale level, was announced by OPA (Amendment 2 to MPR 400, effective March 3.)

Office Machines—WPB—Permission to produce check-handling, coin-handling, and envelope handling machines, currency counting machines, postal permit mailing machines, and stamp cancelling machines on WPB approved orders for Army, Navy, Maritime Commission and for essential industries, was recently granted. Each manufacturer is permitted to maintain inventory equal to 20% of dollar value of same class of machinery billed by him during 1941.

Wax Paper Control Clarified—WPB
Waxed paper of all types and grades other than household packages and wrappings for direct military use are under end use control regardless of method of production. This restriction was clarified by issuance of Interpretation No. 1 to General Conservation Order M-241-a.

Clarify Paper Conversion Order—WPB
—WPB has clarified position of persons converting plain and printed paper for wrapping purposes into retail units to be sold in retail stores. Retail units are regarded as within definition of "converted product" and are therefore subject to restrictions contained in General Conservation Order M-241-a. Clarification was made by issuance of Interpretation No. 20 to GCO M-241-a.

Certain Paper Reserves Changed—WPB
—New percentages of reserves of production capacity and supplies have been fixed for manufacturers of paper and paperboard. Direction 2 to General Conservation Order M-241.

Paper Cup Control—WPB—Rigid control of paper cup manufacturers and distribution appears unnecessary today because of definite improvement in pulp and paper situation, members of the Paper Cup Industry Advisory Committee decided at a recent meeting.

Have you tapped this great source of
MACHINE POWER?



**Machine Power Can Increase the Man Power and
 Woman Power in your Accounting Department**

Increasing man power and woman power—per hour—is simply a matter of saving seconds in performing every accounting operation.

There are machines in the lines of the Underwood Elliott Fisher Company which can save those precious seconds for you on every one of your accounting operations.

Speed, simplicity and accuracy, and at the lowest possible cost, are the basic advantages which you gain through the use of Underwood, Elliott Fisher, and Sundstrand Accounting Machines.

In meeting any problem, Underwood Elliott Fisher representatives are not confined to inflexible methods; nor

are they restricted to the adaptations of only one type of equipment.

With a variety of models and features in each line, Underwood Elliott Fisher provides a *flexible choice*—unique in the accounting machine field—each model in day-to-day service in many thousands of organizations throughout the world.

Your forms may be large or small; printed on paper or card stock; prepared in original only, or with copies that are alike or different in size or shape.

Your records may require writing only, without computing; computing, with or without typed descriptions; addi-

tion, subtraction and individual totals of amounts entered in any number of columns from one to thirty, with or without simultaneous cross-computation of one, two or more balances.

Whatever your individual requirements may be, Underwood Elliott Fisher has both the method and the equipment with which to speed your production and lower your accounting costs—the *best* method and the *right* equipment.

A call to your local Underwood Elliott Fisher office will bring you, without obligation, interesting information on how Underwood Elliott Fisher *machine power* can materially increase the production of your present *man power* and *woman power*.

* * *

Underwood Elliott Fisher Accounting Machines are available subject to War Production Board authorization.



Our factory at Bridgeport, Connecticut, proudly flies the Army-Navy "E," awarded for the production of precision instruments calling for skill and craftsmanship of the highest order . . .

Save the Seconds and You Save the Day—

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PERSONALITIES *in the* NEWS

WITH ROBINS CONVEYOR 45 YEARS

Purchasing Agent Wm. P. Newman Honored at Meeting with "Old Timers"



Left to right, standing: H. Von Thaden, vice president; E. C. Salzman, vice president; T. M. Keith, T. Webster Matchett; R. W. Eichenberger, vice president; E. S. Stadelman. Seated: T. Matchett, president; Purchasing Agent W. P. Newman; Thomas Robins, chairman of the board; Thomas Robins, Jr., Chairman of executive committee.

At a luncheon held in the Passaic City Club, Mr. William P. Newman, Purchasing Agent of Robins Conveyors Inc., manufacturers of materials handling machinery, was honored on the celebration of his 45th Anniversary with that company.

Present at the gathering were 16 people who had spent a total of 400 years with Robins Conveyors. Besides Mr. Newman, those who had seen 30 or more years of service were, in order of precedence: Thomas Robins (53 years), W. R. Browne (39 years), E. S. Stadelman (36 years), E. C. Salzman, R. W. Eichenberger and T. M. Keith (34 years each) and Thomas Matchett (31 years).

Started As Office Boy

Mr. Newman started as Office Boy at Robins, after having served in a similar capacity for Thos. A. Edison for a few years. He has been Purchasing Agent for the past 36 years.

In commemoration of the event, Mr. Robins presented to Mr. Newman a beautiful Gruen wrist watch inscribed: "Robins Conveyors Inc. to Wm. P. Newman—45 years of Loyalty, Integrity and Honor."

Mr. Matchett, President of Robins, acted as toastmaster. Laudatory speeches were made by Thomas Robins, chairman of the board; Thomas Robins, Jr., chairman of the executive committee; Harold Von Thaden, first vice president; E. C. Salzman, vice president in charge of

sales; R. W. Eichenberger, vice president in charge of engineering; and two of the other "old-timers," Messrs. Stadelman and Keith.

1 1 1

Arthur F. Dallia, Purchasing Agent of Justrite Manufacturing Co., Chicago, has been appointed to the Board of Governors of the Chicago Association of Purchasing Agents, to fill the unexpired term of N. B. Brown.

Greer W. Orton has been made Manager of the Purchasing Department, Texas Company, New York, N. Y., succeeding W. F. Moore, who has been promoted to an executive position in a new unit known as Foreign Operations. He formerly was assistant manager. R. S. Hatch is Assistant Manager succeeding Mr. Orton, and R. M. Morrison is General Purchasing Agent.

Rudolph F. King, speaker, House of Representatives, Massachusetts, formerly Purchasing Agent and now general manager of the Levisur Leather Company of Boston, has announced his candidacy for the Republican nomination for lieutenant governor.

Lyle McCauley has been appointed Civilian Purchasing Contractor at Fort Stevens, Astoria, Ore. For the past two years he has been Assistant Purchasing Agent.

George W. Hinds, Purchasing Agent of The Lamson & Sessions Co., Cleveland, Ohio, since 1926, has been named Director of Purchases, and Frank DeCrane



George W. Hinds

has been made Purchasing Agent, according to announcement by President Roy H. Smith of the bolt and nut manufacturing company. Mr. DeCrane was formerly Assistant Purchasing Agent.

Messrs. Hinds and DeCrane have worked together in the Lamson organization's purchasing department for 18



Frank DeCrane

years. Prior to consolidation of other bolt and nut companies with the Lamson & Sessions company in 1926 and 1930, Mr. Hinds started as Purchasing Agent at the Falls River Plant at Kent, Ohio, in 1916. Mr. DeCrane started work as an office boy in 1920 in the old bolt works on Scranton Road, headquarters of the Company in Cleveland since 1869. Both purchasing executives have seen company sales grow from \$9,000,000 to \$25,000,000 annually, and the company's purchases expand proportionately.

R. Harry Brayne, Assistant Purchasing Agent for the Weyerheuser Timber Co.,
(Continued on page 248)



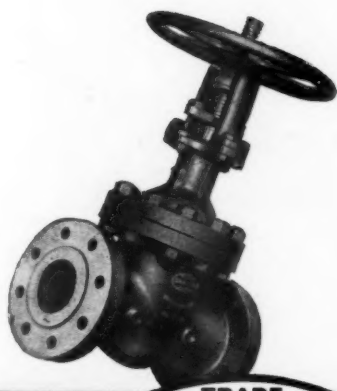
LINE strains, high temperatures and pressures will distort the body of any valve. Only Darling fully revolving double disc parallel seat gate valves have the curved wedge face and transverse bevels that permit the gate to adapt itself to out-of-line positions the valve seats may assume. There's no need to jam or force it; it fits naturally, easily and tightly.

The valve assembly consists of four simple parts—two discs, two wedges. These can easily be removed for inspection or maintenance without tak-

ing the valve from the line. When the valve closes, the two wedges force the discs firmly against the valve seats. On opening, the first quarter-turn instantly releases the wedges and frees the discs to be raised with less seating wear.

The discs are fully revolving through 360° and seat themselves in a different position each time the valve is closed. Thus wear on disc and seat is uniform, and life-long, tight closing results.

For drop-tight closing, year after year, for long, economical, trouble-free service, specify Darling Valve.



DARLING

MARK

VALVE & MANUFACTURING CO.

WILLIAMSPORT, PA.

★ ★ ★ ★

WORK CLOTHES DESIGNED EXCLUSIVELY for Women



Smart Work Clothes

AVAILABLE QUICKLY!

Don't let women workers don makeshift clothing when Moore Victory Uniforms are so easily available... so safe to work in and so moderately priced. Full-cut, tested in action for comfort and safety, Moore work clothes are made exclusively for women and are therefore flatteringly feminine. Get illustrated style book showing smart slack suits, coveralls, work dresses now made up for you quickly, with our increased production facilities, in a choice of Sanforized-shrunk materials. Also Moore Victory Headwear and Insignia—at remarkably low prices.



Write for Illustrated Style Book PM4

E. R. MOORE Company

932 Dakin Street
Chicago 13, Illinois

(Continued from page 246)

Longview, Wash., has been made Purchasing Agent for the company's logging operations at Vail and McDonald.

Charles R. Painter has been promoted to General Purchasing Agent of the New York, New Haven and Hartford Railroad Co., with headquarters at New Haven, Conn. Frank I. Foley was made manager of stores, and Charles H. McGill became general storekeeper.

Mr. Painter, born at Muncy, Pa., started railroading in 1905, coming to the



Charles R. Painter

New Haven from the Sante Fe in 1917 as chief clerk to the general storekeeper. He was appointed assistant to the general Purchasing Agent in 1925, assistant to vice president in 1929, and was promoted to Purchasing Agent in 1929, the position held until his present promotion. Manager of Stores Foley started with the New Haven in 1902 as clerk in the master car builder's office. In 1907 he entered the stores department, serving as chief clerk, storekeeper, supply agent, assistant general storekeeper and general storekeeper, serving in this position from 1927 until his present promotion as manager of stores. General Storekeeper McGill started in the company's maintenance of way department in 1910, serving as water boy, laborer, timekeeper, and assistant work train foreman. His first job in the stores department was as supply train foreman in 1917. Subsequently he served as supply train storekeeper, traveling storekeeper, and assistant general storekeeper.

E. A. Workman has been appointed Purchasing Agent of the Central Railroad of New Jersey, with headquarters at 143 Liberty St., New York. Mr. Workman returns to the Jersey Central after an absence of ten years during which he was Director of Stores for New York City. He succeeds W. A. Clem, who has been serving at Philadelphia as joint Purchasing Agent for the Jersey Central and the Reading, and who remains with the Reading. The railroads, which were affiliated until the Jersey Central went into reorganization in 1939, have virtually completed the process of division into separate organizations.

A native of Keyser, W. Va., Mr. Workman's first regular job, at 18, was as a storekeeper at Keyser for the Balti-

more & Ohio Railroad. He climbed to the position of district storekeeper for the B. & O.'s Maryland District before joining the Jersey Central from July 1, 1926, until December 31, 1933, as Manager of Purchases & Stores. Then he organized New York City's vast stores system on a centralized basis and assisted in the reorganization of centralized purchasing, resulting in a saving to the taxpayers of the City of New York of approximately \$50,000,000 in the ten-year period. Mayor F. H. LaGuardia recently declared "It's been a grand job."

Hermann Decauter has been made Purchasing Agent for the Cincinnati Milling Machine Co., succeeding Robert J. Duerler, who is now lieutenant (j.g.), United States Naval Reserve. Lieut. Duerler also was president of the Cincinnati Association of Purchasing Agents, and has been succeeded in that office by A. H. Bader, Purchasing Agent, Jos. T. Ryerson & Son Company.

V. C. Fuller, Purchasing Agent, Gulf Oil Corp., and J. H. Wolfe, Purchasing Agent, British-American Oil Prod. Co., Tulsa, Okla., have been elected chairman and vice-chairman, respectively, of the Oil Industry Committee of the Tulsa Chamber of Commerce.

W. E. Wickham, Purchasing Agent, E. F. King & Co., Inc., Boston, Mass. prior to entering the military service has been promoted to Major in the Army Air Corps. He is with the Aircraft Distribution Office, Patterson Field, Fairfield, Ohio.

Gordon K. Tollaksen has been appointed Purchasing Agent of the Dumore Company, Racine, Wis., manufacturers of fractional horsepower motors and port-



able precision tools. He succeeds J. M. Hamilton. Mr. Tollaksen became associated with the Dumore Company as Assistant Purchasing Agent in 1942 after being connected with the sales organization of the National Cash Register Co. for some five years.

Major George J. Cronin has been re-appointed a member of the Massachu-

(Continued on page 250)

Your Pipe Cutting is much
Easier and Faster
with the
RIGID
Thin Blade
Cutter



*10 Second
Adjustment*
to thread 1" to 2" pipe

Spin it up
—move pin
—spin it down—
a 10 second
job!

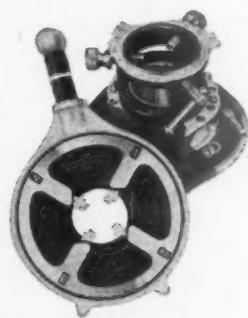


RIGID No. 42 4-wheel Cutter with short-handle for cutting in tight places, cuts quickly with quarter turn.

● Clean cuts with less effort — this **RIGID** Cutter gives you that kind of service because the special thin-blade cutter wheel, coined from tool-steel, heat-treated and assembled in a steel-bushed hub, knifes right through the pipe, practically without burr; because the heavy-duty malleable frame is warp-proof, always cuts true; and because the tool is so well balanced you get most action for least effort. You'll like the smooth performance of the **RIGID** Cutter — ask for it at your Supply House.

and you cut micrometer-perfect threads
with this **RIGID** No. 65R

● It's almost automatic — it's a pleasure to use. Self-contained, a simple 10 second adjustment prepares it to thread 1", 1¼", 1½" or 2" pipe. Mistake-proof workholder sets to size instantly — no bushings. High-speed steel dies cut precision threads you're proud of. Rugged steel-and-malleable construction assures you extra long tool life. Don't miss the advantages of this most modern threader — ask to see it at your Supply House.



No. 65R is made in 6 models to meet your needs.

Sold by Supply Houses Everywhere

RIGID
★ PIPE TOOLS ★

Millions of **RIGID** Tools in use



THE RIDGE TOOL COMPANY
Elyria, Ohio, U. S. A.





M-S-A *All-Service** GAS MASK MODEL S CANISTER...



Model S Canister with Standard Canister in background.

The M.S.A. All-Service Mask with Model S canister meets respiratory protective requirements against poisonous industrial gases, toxic dusts, mists, smokes, etc.—singly or in combinations (including carbon monoxide); is officially approved by the U. S. Bureau of Mines, and offers maximum comfort and convenience in service. Special features of the canister are its uniquely-designed large-area filtering element for smokes, dusts and fumes—of particular value under certain emergency conditions—and lower resistance to breathing.

The M.S.A. All-Service Mask is equipped with the famous All-Vision facepiece, which allows unobstructed vision at all angles, fits comfortably without drawing or binding, and affords a perfect gas-tight seal. Complete working freedom is permitted by the strong, durable harness, which is easily and quickly put on or removed.

Both the Model S All-Service Mask canister and the Standard All-Service canister are interchangeable in the harness. A strongly constructed fiber carrying case accommodates the mask equipped with either canister, together with a spare. To adapt All-Service cases now in use for the Model S canister, it is necessary only to remove a small fiber bracket. Write for complete details on the M.S.A. All-Service Mask with Model S and Standard canisters, in descriptive bulletin No. EA-8!

STANDARD MODEL ALL-SERVICE MASK

Providing protection for many years throughout industry against poisonous industrial gases, smoke and fumes encountered singly or in combination—including carbon monoxide—the M.S.A. All-Service Mask with Standard Model canister is still available.

Officially approved (Approval No. 1405) by the U. S. Bureau of Mines.

*Trademark Reg. U. S. Pat. Off.

MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STREETS • PITTSBURGH, PENNA.

District Representatives in Principal Cities

(Continued from page 248)

setts Commission on Administration and Finance and Purchasing Agent of the Commonwealth, by Governor Saltonstall. Major Cronin became Assistant Purchasing Agent in 1923 and was advanced to Purchasing Agent two years later, and has been reappointed continuously by the succeeding state governors. He is a past president of the New England Purchasing Agents Association and a member of the Board of Directors of the National Association.

R. W. Sutton has been appointed Purchasing Agent of Truscon Steel Co., Youngstown, Ohio, subsidiary of Republic Steel Corporation, according to announcement by C. A. Ilgenfritz, Manager of Purchases and Raw Materials for Republic. Associated for many years



with industrial purchases, Mr. Sutton has been a buyer for Republic for the last 13 years. He came to the general office of the company from Republic's Dilworth-Porter Division, Pittsburgh, and earlier was connected with the National Plate Glass Company, a division of General Motors.

Harry L. Erlicher, Vice President in Charge of Purchasing and Traffic, General Electric Co., is the subject of an interesting biographical sketch, of the "boy who made good," in the February issue of the Monogram, an intracompany magazine published by G.E. The story is prefaced by a full page portrait of Mr. Erlicher. He started with G.E. as an office boy when 14 years of age, in the accounting department, and three weeks later was transferred to the Purchasing Department as a clerk. "Today," says the article, "he is vice president charged with a dual operation, which is constantly critical, ever exacting, often baffling, and at all times of supreme importance to the company's war activities. Purchasing for a company as large as General Electric—and Erlicher's department functions for the entire company—is something much broader and vastly more complex than the word implies. The influence of purchasing on ultimate cost and quality is obvious, but there are many other ways in which the department contributes. As an example—Erlicher has developed a program of exploration, seeking new and substitute materials which may improve the product and reduce the

(Continued on page 252)



3 STEPS TO BROADER FIELDS OF USEFULNESS

Cloth is not finished, it has not passed its last frontier. Coupled with the science of chemistry and the magic of plastics, cloth is definitely in the material picture of postwar planning. Only woven cloth affords structural and tensile strength with extreme durability and flexibility. Cloth drapes, folds, creases, bonds, reinforces, protects, decorates.

FILLING

In the three major steps of specialized cloth treatment, *Impregnating, Filling, and Coating* — filling means closing the interstices between the woven strands sealing the cloth and making it a barrier to the passage of light, air, gases, moisture, etc. Filling may or may not change the appearance of the fabric or affect its natural qualities. Its variations are endless.

We start with cloth and, through knowledge of processing, plus adequate research facilities, add special properties for special needs.

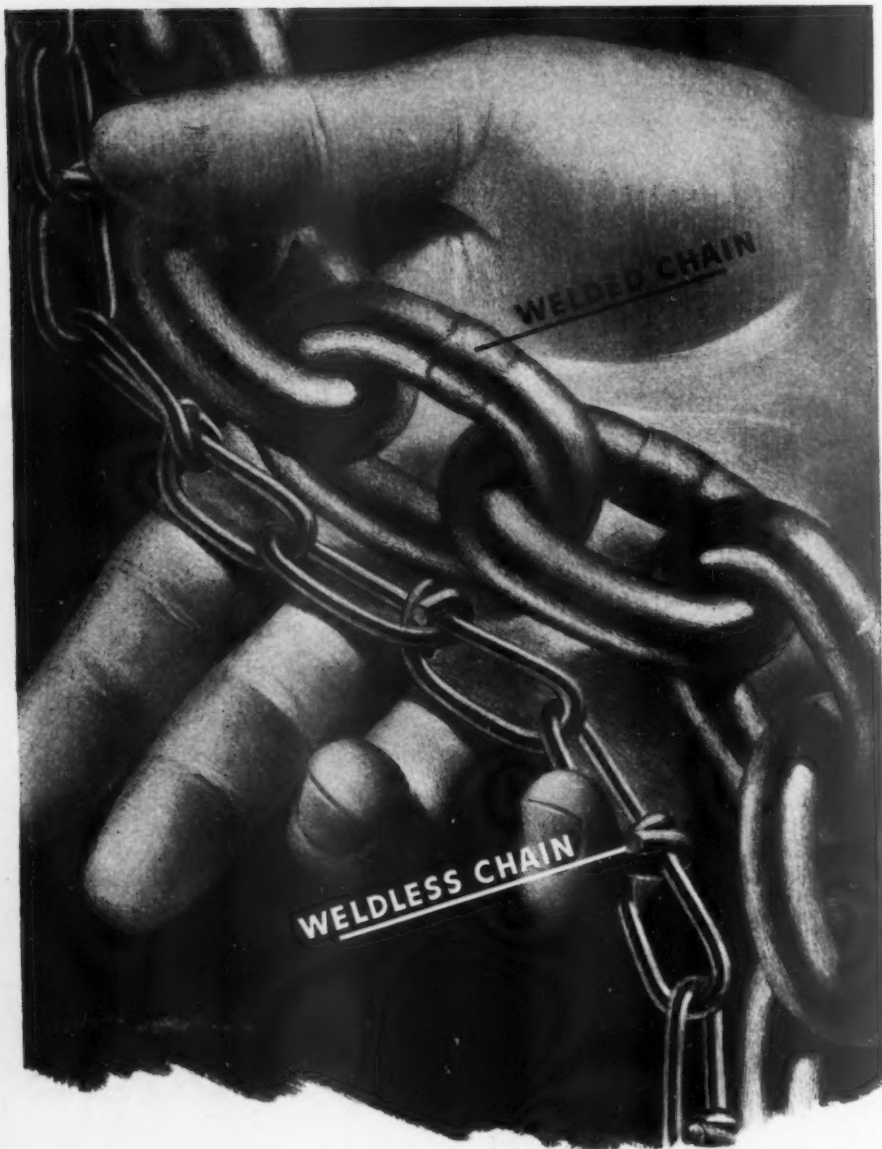
CURRENT HOLLISTON PRODUCTION

includes COATED AND IMPREGNATED FABRICS . . . INSULATING CLOTH BASE . . . SEPARATOR CLOTHS rubber, starch-filled, glazed. TRACING AND BLUE PRINT CLOTHS white and blue, ink or pencil. MAP CLOTH, PHOTO CLOTH, self-adhesive. REINFORCING FABRICS. SIGN, LABEL AND TAG CLOTHS, waterproof to take any ink, meet any inking problem. BOOK-BINDING CLOTHS. SHADE CLOTH, impregnated waterproof, opaque, translucent or light proof.

We urge you to consider CLOTH; and invite you to consult with us concerning possibilities and developments for your specific requirements.

The Holliston Mills, Inc.
PROCESSORS OF CLOTHS FOR SPECIAL PURPOSES
NORWOOD, MASSACHUSETTS
Sales Agents in Principal Cities

AMERICAN CHAIN ASKS A QUESTION:



HOW MANY USES HAS CHAIN?

Every time we make a list, someone finds new things that American Chain chains are doing better, or more economically, or more safely. • During the war, for example, American weldless chains have been widely substituted for manila rope. Another wartime use is in chain ladders, thousands of them, for our warships and transports. Millions of feet of American chains are being used by the Army, Navy, Coast Guard and Maritime Commission, for countless purposes. • American chains are everywhere, often out of sight—holding, hauling, lifting—wherever people live or work. As the world's largest manufacturer of welded and weldless chains, we make hundreds of patterns and sizes, and are always interested in learning of new uses. • Like all of "Acco's" diversified products, American chain is essential in peace, vital in war.



In Business for Your Safety

AMERICAN CHAIN & CABLE COMPANY, INC.

BRIDGEPORT, CONNECTICUT • In Canada—Dominion Chain Company, Ltd.
In England—The Parsons Chain Company, Ltd., and British Wire Products, Ltd. • Aircraft Controls, American Chain, American Cable Wire Rope, Campbell Cutting Machines, Ford Chain Blocks, Hazard Wire Rope, Manley Garage Equipment, Maryland Bolts and Nuts, Owen Springs, Page Fence and Wire, Reading Castings, Reading-Pratt & Cady Valves, Wright Hoists and Cranes.

(Continued from page 250)

cost. Purchasing stands at a central point and must know the problems of both engineering and manufacture and have the means to satisfy their demands, whilst keeping an alert eye on constantly changing sources and markets. It must anticipate demand, anticipate supply, and know the right minute to buy, all at the same time. Its right and left hands must move in complete co-ordination and keep materials coming in a constant flow. There can be no more significant comment or finer tribute to Erlicher's operation than the simple statement of the fact that in the entire company the work of no department has been retarded or has suffered delay through dereliction of the Purchasing Department. Harry Erlicher is a good provider, as they say in the Mohawk Valley."

Walter R. Youngberg, Elmhurst, Ill., who, as announced in March *PURCHASING Magazine*, has been appointed State Purchasing Agent, Springfield, Ill., succeed-



ing Colonel Edward Davis. Mr. Youngberg has been assistant Purchasing Agent for nearly two years. Previous to the latter appointment in 1942 he was county treasurer, Du Page County, Ill. He was in the armed forces during the first World War, and upon his return took over the general contracting business established by his father, and operated it until ten years ago. He has been active in banking and financial affairs since then, and is now a director of the Elmhurst National Bank.

Harold A. Johnson, Division Purchasing Agent, U. S. Rubber Company, New York, is the author of a guest editorial in a recent issue of the *Daily News Record*, New York, on the subject of post-war relationships. "The industrial consumer of textiles realizes that the measure of his success lies in the proper evaluation of the goods offered by the different groups such as rayon, nylon, glass, paper, plastics, hemp and many others. For example, paper will try to crowd out cotton in such products as carpets and laminated plastic articles. Glass, rubber, vinyon, etc., will be striving for their share of the filter cloth business; rayon, nylon, steel and others for the tire business. This need not be a "Free for all" with the industrial consumer getting all the benefit of the re-

(Continued on page 254)

YES...a WALSEAL* fitting can be removed

...but not by
**SHOCK,
VIBRATION or
HEAVY PRESSURE**



Silbraz* joints are the strongest connections that can be made on brass or copper pipe or tubing. In hundreds of installations, Walseal Valves, Fittings or Flanges for making Silbraz joints (patented products of the Walworth Company), have proven their ability to withstand severe shock and vibration, resist corrosion and remain tight and leakproof.

But when a Walseal fitting must be removed to make alterations or repairs, it can be easily done. To remove a Walseal flange, for example, heat around the entire hub of the flange, with an oxy-acetylene flame, until the hub turns a dull red color. Direct little or no heat to the pipe or tube. The flange is then given a slight shaking motion by a helper, using hooks. The shaking motion of the heated flange breaks the brazed joint and allows air to enter between the parts, quenching the alloy. The flange may then be removed.

The flange may be re-used in the same or a new position. Enough alloy usually remains in the insert groove to permit a second joint to be made, without the necessity of inserting additional alloy.

For complete information on the installation of Walseal valves, fittings and flanges, send for Bulletin No. 84.

*Registered Trade Marks.

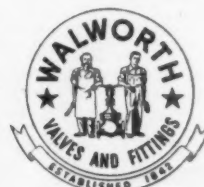
SEND FOR CATALOG

You'll find pertinent information on Walworth's complete line of valves, fittings, pipe, and pipe wrenches in the new Walworth Catalog 42. Included are 78 pages of practical engineering data that simplify valve selection and make piping layouts easier. Write, on business stationery, for your free copy. Address: Walworth Company, 60 E. 42nd St., New York 17, N. Y. Dept 416



WALWORTH

valves and fittings

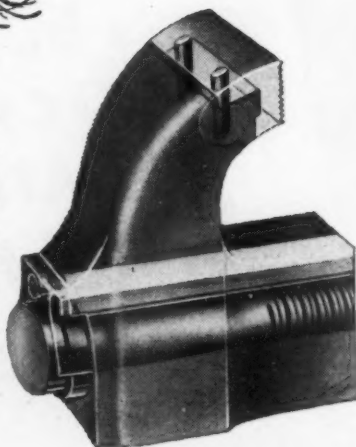


DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

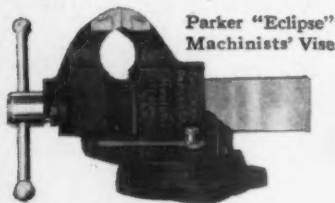
REAL SADDLE FIT!



Parker eliminates the slack usually found in vises by maintaining an absolute saddle-fit between the vise screw and the slide. This construction also allows stronger, solid casting of the underportion of the slide, and permits adequate lubrication. The Parker Solid Underportion is one of the important reasons why Parker Vises "Grip Like a Grizzly." The Charles Parker Company, Meriden, Connecticut.

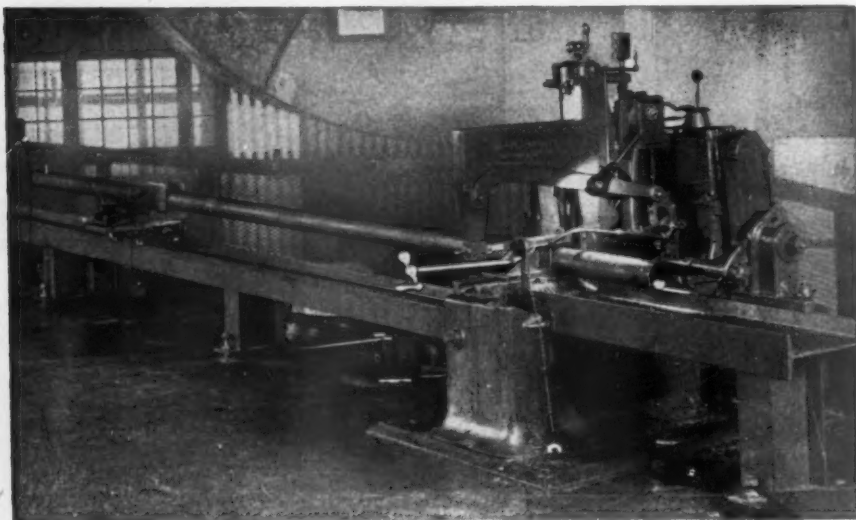


Parker Solid Underportion Construction



Parker "Eclipse" Machinists' Vise

PARKER VISES
America's Oldest



MARVEL SAWS

cut-off
metal the
economical
way

• The most economical method of cutting-off identical pieces from bar steel is with a MARVEL Automatic Production Saw. It will give you more pieces per hour, per machine and per dollar cost than any other hack sawing machine. Figured in cost per piece, it will have the lowest tool cost and the lowest labor cost too, because MARVEL Automatic Saws operate with no more attention than an automatic screw machine. They keep chip loss down to a minimum and on many jobs will give you extra pieces per bar. For fast automatic production or for single-cut miscellaneous work, MARVEL 6A or 9A Hack Saws are fast, accurate tools. Capacities 6" x 6" or 10" x 10", single or nested bars. Write today for Bulletin No. 600.

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Ave.

Eastern Sales Office: 225 Lafayette St., New York

Chicago 39, U. S. A.

(Continued from page 252)

sulting improvements. It can be healthy for all the participants—make them exercise their ingenuity and enable each to gain and grow. Possibly the textile mills can contribute to or even develop the next lucrative field. Certainly, they will do well to emphasize team work and enthusiasm for their research activities. They can be very sure that they will find industrial consumers anxious to meet them more than half way in studies and developments of better methods and products." He declared that compared with such industries as chemical, automobile, electrical and many others, the cotton manufacturing industry doesn't apply the same energy to self improvement.

W. H. Herbert, for many years coach of the varsity track and field teams and freshman football coach at Ohio, Athens, Ohio, has been named Purchasing Agent and associate professor of commerce. Mr. Herbert was graduated from Ohio University with the degree of Bachelor of Arts in Commerce and later earned a



master's degree from Columbia University. He spent one year as athletic director and coach at Northwest Missouri State Teachers College, Maryville, Mo., but returned to Ohio University as instructor in physical education in 1926. During his college career at Ohio he established a number of track records which remained unbroken for many years and was chosen as an all-Ohio guard in football. Until approximately 18 months ago Mr. Herbert was connected with the athletic department of the university. Late in 1942 he was made Acting Purchasing Agent for the school.

Harold K. LaRowe, Purchasing Agent of the Chemical Construction Co., New York, N. Y., recently addressed a meeting of the Power Transmission Council, discussing the subject of what a buyer expects from a sales presentation and how to make the most of the sales interview.

H. J. Ayotte has been made Purchasing Agent for the Puget Sound Shipbuilding Company, Olympia, Wash., succeeding J. D. Newell who has been named general manager at the yard and treasurer of J. E. Haddock Company, Ltd., a stock-

(Continued on page 256)

IF THE FORGING IS HEAVY DUTY, IT SHOULD BE NATIONAL FORGED

A Forging is born IN A BATH OF STEEL

AND the steel must be right. Not just as fine steel, but as the correct analysis for the work and service the heavy duty steel forging is destined to perform.

National Forge makes certain of the steel quality in its forgings by making its own steel in Heroult basic electric furnaces—a process that permits the closest metallurgical control. The steel must measure up to requirements and National Forge has an unsurpassed reputation for making "clean steel." The close control and rigorous inspection makes sure that the steel is free from injurious defects. It must meet the analysis and have the correct grain structure required by the purpose of the forging.

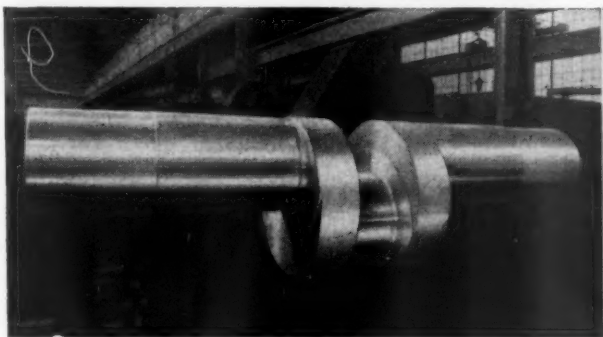
Made right, poured right and properly pre-heated, the steel ingot is ready for the expert forgesmithing, heat treating and high precision finish machining operations which are so essential in producing a forging that will deliver long sustained performance.

There is no divided responsibility when National Forge makes a forging and you always have greater confidence in the forgings that are National Forged.



For this extra heavy press crankshaft, an ingot of ample size was required to permit thorough working in the forging press—a National Forge practice which assures forgings of inherent stamina.

A forging begins to take shape in the teeming of the ingot—a process simple to picture but highly important in the making of quality forgings.



NATIONAL FORGE & ORDNANCE CO.

IRVINE, WARREN COUNTY, PENNA.

"WE MAKE OUR OWN STEEL"

For Excellence



in Production





*Better Fasteners
for you TODAY and TOMORROW*

because of
**Oliver's SKILLED PERSONNEL and
SPECIALIZED MACHINERY**

The accuracy and uniformity of Oliver bolts, nuts and rivets comes from a combination of careful planning, skilled personnel and modern, specialized machinery. To the user of industrial fasteners, these qualities mean greater dependability, faster assembly, lower costs.

Add to this the fact that Oliver is prepared to meet your special requirements for alloy steels, galvanized or plated coatings, heat treatments, special designs, etc., and you find a capable source of help in solving your fasteners problems.

OLIVER IRON & STEEL CORPORATION

SOUTH TENTH AND MURIEL STREETS • PITTSBURGH, PA.

(Continued from page 254)

holder in the shipbuilding concern. Mr. Ayotte formerly was Assistant Purchasing Agent.

Albert C. Card has been made Assistant General Purchasing Agent of the Union Pacific Railroad, Omaha, Nebr., being promoted from the position of equipment clerk and assistant to the general purchasing agent.

Clifford G. Allen has been elected Vice President—Purchases and Stores, Akron, Canton & Youngstown R.R., with headquarters at Akron, Ohio.

John J. Dahm, Purchasing Agent, Chicago Flexible Shaft Co., Chicago, Ill., has been made Vice President in Charge of Procurement.

Robert T. Saunders, Purchasing Agent, Saunders & Co., Chicago, Ill., has been commissioned a Lieutenant, junior grade, U. S. Naval Reserve. He has been temporarily assigned to the Navy Bureau of Supply and Accounts, Washington.

C. M. Cobb, Purchasing Agent, A. E. Staley Mfg. Co., Decatur, Ill., has resigned to take a long-needed rest. He joined the Staley organization in 1919 as Assistant Purchasing Agent, and was made Purchasing Agent in 1923.

George L. King has been appointed Purchasing Agent of the Mayflower Hotel, Washington, D. C. Mr. King, who has been assistant wine steward for several years, succeeds Mrs. Frances D. Lyon who has resigned to join her army officer husband in Indiana.

Mrs. Doris Diedrich, Purchasing Agent, Kirkeby Hotel, has been elected president of the Hotel Women's Association of Chicago.

Mrs. Asher B. Arnold has been appointed Purchasing Agent, city of Haverhill, Mass., succeeding Charles P. Kelleher who has joined the Armed forces.

**AMONG THE COMPANIES
YOU BUY FROM**

Philip H. Clapp has been appointed abrasive division district manager for the Pacific coast by Norton Co., Worcester, Mass., in Los Angeles. He will be succeeded as district manager for Detroit by Donald L. Price.

Kennametal Inc., Latrobe, Pa., has opened a new branch office at 378 5th St., San Francisco 7, Calif. The office is in charge of George Dolan. Sales representation by the Walter R. Carr Co. is discontinued.

Harry A. Armbright has been appointed eastern sales manager for the American

(Continued on page 258)

More Speed for every hand tool operation . . . Snap-ons deliver it . . . with less effort, greater accuracy and utmost safety! In hundreds of plants engaged in critical war production, Snap-ons are standard tool equipment . . . the choice of better mechanics throughout industry. 3,000 modern Snap-on tools provide a wide selection for production, assembly and maintenance operation. Snap-on offers direct-to-user tool service through 37 factory branches in key production centers. Write for catalog!

Snap-on Tools
THE CHOICE OF BETTER MECHANICS



SNAP-ON TOOLS CORPORATION • 8048-D 28th Avenue • Kenosha, Wisconsin




A SMALL RHEOSTAT *with* BIG FEATURES

Ward Leonard has produced their 4" Plate Type Rheostat with all the desirable features of their largest equipment. It dissipates heat from both sides. The contacts are solid metal blocks for durability. Action

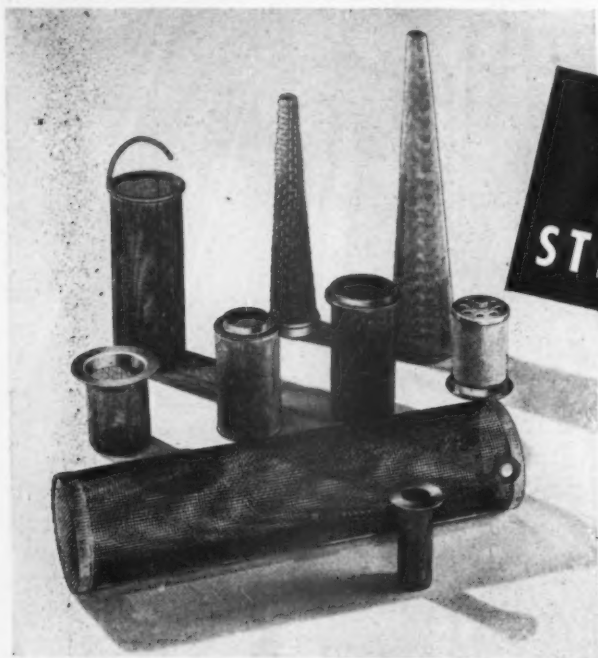
is smoothness itself. There are forty-three steps of control. Data Bulletins are available on the various Ward Leonard Rheostats. Write for bulletins describing the size and type of Rheostats of interest to you.



WARD LEONARD
RELAYS • RESISTORS • RHEOSTATS

Electric control  devices since 1892.

WARD LEONARD ELECTRIC COMPANY, 50 South St., Mount Vernon, N. Y.



**JELLIFF
FUEL
STRAINERS**

**IF YOU WANT
quality strain-
ers on time, at
a fair price,
WRITE US
NOW.**

Jelliff has all the facilities for making fuel strainers. Wire drawing, weaving, and fabricating all in one plant — each step carefully watched by an inspector trained for that particular job. Rigid adherence to specifications and tolerances is guaranteed; AND SHIPPING SCHEDULES ARE MAINTAINED.

The C. O. JELLIFF MFG. CORP.
22 PEQUOT AVENUE • SOUTHPORT, CONN.

(Continued from page 256)

Central Mfg. Corp., Connersville, Ind. He will direct sales in 13 eastern states from Maine to Virginia from offices in New York City.

David A. Coleman has been elected vice president of the Lake Shore Tool



Works Inc., Chicago. He has been personnel manager, production manager and sales manager for the company.

Edward A. Kreller has been appointed manager of the Cast to Shape Department for the Jessop Steel Co., Washington, Pa. He was associated with the Detroit Alloy Steel Co., Detroit for 21 years.

William F. Vosmer has rejoined Republic Steel Corporation, Cleveland, O., as manager of railroad sales after an absence as executive in the Steel Section of WPB in Washington. Before entering government service he was manager of sales, bar division.

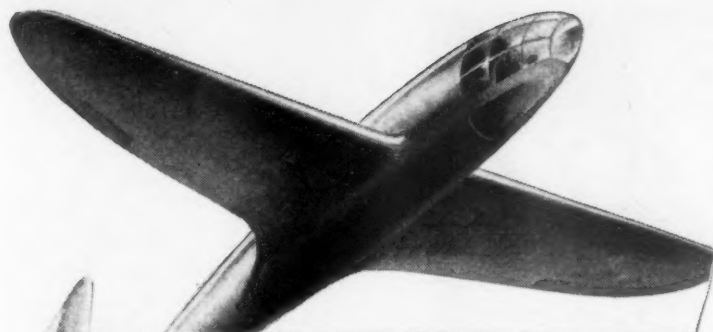
Raymond C. Franklin has become a member of the sales staff of the Continental Screw Co. His territory includes



Delaware, Maryland, the District of Columbia and neighboring parts of Pennsylvania and New Jersey. Mr. Franklin will maintain headquarters in Germantown, Philadelphia.

Nelson Bauer has been promoted to assistant general sales manager of the Pyrene Mfg. Co., Newark, N. J. He has been succeeded as Newark district manager by Raymond F. Poole who comes from the Chicago district. Frank

(Continued on page 260)



GLAD TO SEND YOU A RICH WOODCUT PRINT SHOWING THE ORIGINAL USE OF JET PROPULSION BY HERO OF ALEXANDRIA, 130 B.C.

READING-PRATT & CADY

MANUFACTURERS OF
READING CAST STEEL VALVES AND FITTINGS
PRATT & CADY BRASS AND IRON VALVES
D'ESTE VALVE AND ENGINEERING SPECIALTIES

Reading, Pa., Atlanta, Boston, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco

A DIVISION OF AMERICAN CHAIN & CABLE COMPANY, Inc. BRIDGEPORT • CONNECTICUT



what e.

—a newspaper editorial,
January 14, 1944

MILITARY SECRET FROM 130 B. C.

The jet propulsion plane apparently is a rocket plane without the fire and smoke. The invention, no doubt, will be credited to modern day science and ingenuity, altho the greatest wonder about jet propulsion is that mankind has let the idea kick around for so long without putting it to use.

If you want a picture of the first jet propulsion motor, flip the pages of the dictionary to the word aeolipile. The aeolipile was the first steam engine, and it was jet propulsion, pure and simple. Hero of Alexandria, a Greek mathematician and physicist, about whom little is known except that he probably lived about 130 B. C., invented or gave the first account of the aeolipile.

It is a metal basin with a cover, standing on a tripod. Hollow tubes lead up from the basin or boiler to a metal sphere, which is mounted so that it can revolve. Two jets protrude from opposite sides of this sphere, with their tips turned at a tangent to the sphere, like the arms of a swastika. Put some water in the basin, build a fire beneath it, and the steam whistles out of the jets, spinning the ball.

Men have learned to do a lot of things with steam since Hero's time, but it took them more than 2,000 years to realize that Hero had something in jet propulsion.

The announcement of the new jet-propelled mystery war plane—unspeakably fast and powerful—just gives more proof to those old-timers who stick to the idea that there is nothing new under the sun.

A Chicago newspaper in an editorial late in January traced the idea to Hero of Alexandria and dated its first use as 130 B.C.—in what is often called the original steam engine.

READING-PRATT & CADY's research ran across the story about five years ago—and a very early drawing of the steam engine. We located an old-time woodcut craftsman and asked him to reproduce the ancient sketch.

The $5\frac{1}{4}$ " x $5\frac{1}{2}$ " prints were so interesting and rich in their early simplicity that we offered to send a copy, mounted on mat board ready for framing, to any who would like one.

Today, because of the nation-wide interest in jet propulsion, we are repeating the offer. Please make your request on the letterhead of your company and address our offices at Reading, Pennsylvania.

**JOEY
ON-THE-JOB
SAYS...**



JOMAC HEAT-RESISTING, LONG-WEARING GLOVES

They are proving themselves in hundreds of shops where workers must handle metals too warm to touch. The remarkable Jomac Fabric is a loop-finished cloth with air-cell "cushions" which allow breathing-space and an easy dissipation of heat. Jomac's loop finish gives extra protection to hands, extra long wear.

JOMAC REGULAR INDUSTRIAL GLOVES



A modern work-glove that is semi-heat resisting and gives as much as 7 times the service of ordinary work gloves. Jomac Fabric and its hidden lock-stitch keep the thick pile in place and provide extra strength and wear. Jomac Gloves can be washed repeatedly, kept clean . . . and thus minimize the dangers of dermatitis and other skin infections.

TEST THEM !

Just try JOMAC GLOVES on your stiffest jobs. Test them for heat-resistance, for wear, for washability, for economy, for increased production. Write for full details.

JOMAC WORK GLOVES

C. WALKER JONES CO.

6135 N. Lambert St., East Germantown, Philadelphia 38, Pa.

(Continued from page 258)

R. Kachel has taken over Mr. Poole's position as assistant district manager in Chicago. Another advancement is that of Truman Young, formerly assistant advertising manager, to advertising manager.

George H. Clark, vice president of the Formica Insulation Co., Cincinnati, O., has been appointed a member of the



Subcommittee on Wood and Plastics for Aircraft of the National Advisory Committee for Aeronautics for 1944. The Committee is an independent research and fact-finding agency for development of aircraft in this country, established by Congress.

Wynn F. Rossiter has succeeded Charles W. Olsen as district manager at Hartford, Conn., for the Carpenter Steel Co., Reading, Pa. Mr. Olsen has retired after 49 years of active service with the company.

Allegheny Ludlum Steel Corporation, Brackenridge, Pa., has announced the following personnel changes: Russell M. Allen, formerly general manager in



charge of sales, has been elected vice president in charge of sales; P. E. Floyd, former manager of sales, Chicago district, was made assistant general manager of sales; W. G. McFadden district manager of the Chicago office.

Alton Parker Hall has been appointed assistant general manager of sales of American Chain & Cable Co., Inc., Bridgeport, Conn. Previously, he had been associated with Bethlehem Steel Co.

Paisley Products, Inc., Chicago, Ill., has opened a southern sales office in The Balter Building, New Orleans, which is in charge of Jerry Mayo.

(Continued on page 262)

DO YOU NEED HELP TO KEEP YOUR SUPPLY LINE OPEN?

Need General Purpose Steels?

Many a war job has been speeded up by a call to one of our warehouses. Our stocks, even today, are large. So if you need steel, steel products, machinery and equipment, we'll get it to you quickly if at all possible—subject, of course, to priority requirements. A call to us has saved many a situation. Try us—you'll get prompt, courteous attention. Phone, write or wire our nearest warehouse.

Are you using National Emergency Alloy Steels?

These wartime steels have proved a boon to hundreds of defense plants in meeting conditions imposed by shortages of critical material. In many cases they have performed even better than steels ordinarily used. We have been able to help many of our customers with these steels. If you have any problems connected with their use, we'll gladly assist you in determining the grades best suited to your needs.

Want Aircraft Steels?



Our Chicago Warehouse is designated by the War Production Board as a warehouse to distribute the Aircraft Steels listed below:

WD-X-4130 SHEETS
Open Hearth, Pickled and Oiled to Spec. AN-QQ-S-685. All gauges .016 to .50, sheets 18" x 72".

NE-8630 SHEETS
Open Hearth, Pickled and Oiled to Spec. AN-S-12. All gauges .016 to .50, sheets 18" x 72".

STAINLESS SHEETS
Spec. AN-QQ-S-772.
Spec. AN-QQ-S-757.

STAINLESS STEEL BARS
Spec. AN-QQ-S-771.

These steels are for use in airplanes and available at our Chicago Warehouse only. Phone, write or wire if you are eligible for these steels.

WELDING ELECTRODES—ALL TYPES

These are available through all our warehouses.



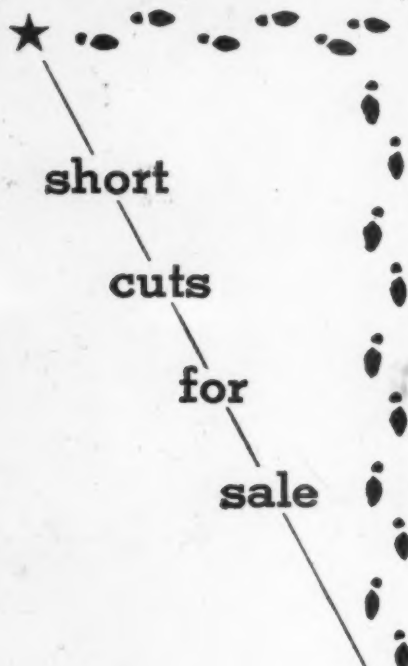
Send for **FREE** copy of our new Stock List and Reference Book

UNITED STATES STEEL SUPPLY COMPANY

| | | | |
|-------------------|---|-------------------------------|----------------|
| CHICAGO (90), | 1319 Wabansia Ave., P. O. Box MM | Teletype CG. 605 | BRUNSWICK 2000 |
| BALTIMORE (3), | Bush & Wicomico Sts., P. O. Box 2036 | Teletype BA. 183 | GILMORE 3100 |
| BOSTON (34), | 176 Lincoln St., Allston, P. O. Box 42 | Teletype BRTN. 10 | STADIUM 9400 |
| CLEVELAND (14), | 1394 E. 39th St., | Teletype CV. 153 | WENDERSON 5750 |
| MILWAUKEE (1), | 4027 West Scott St., P. O. Box 2045 | Teletype MI. 507 | MITCHELL 7500 |
| NEWARK (1), N.J., | Foot of Bessemer St., P. O. Box 479 | Teletype NK. 74 | BIGelow 3-5920 |
| | | REctor 2-6560 - BErgon 3-1614 | |
| PITTSBURGH (12), | 1281 Reedsdale St., N. S. | Teletype PG. 475 | CEdar 7700 |
| ST. LOUIS (3), | 21st & Gratiot Sts., P. O. Box 27 | Teletype SL. 384 | MAIn 5235 |
| TWIN CITY, | 2545 University Ave., St. Paul (4), Minn. | Teletype STP. 154 | NEstor 2821 |

UNITED STATES STEEL

POST WAR STRATEGY



To Meet Rush Schedules

on assembly lines for many of American war machines revolutionary time-saving methods and devices were invented here.

To Save You Steps

in your manufacture of post-war products, leave the parts production up to us.

The Specialist Can Do
A Better Job For Less

★
U.S. AUTOMATIC
CORPORATION
Screw Machine Products
AMHERST • OHIO



(Continued from page 260)

G. Bronson Philhower has been added to the staff of the New York office of Tube Turns, Inc., Louisville, Ky., to represent the firm in metropolitan New York and New England.

M. P. Nickerson has been appointed general apparatus & supplies manager at headquarters, 150 Varick St., New York,



Westinghouse Electric Supply Co., with complete responsibility for the development, coordination and promotion of apparatus business nationally.

The Pennsylvania Salt Mfg. Co., Philadelphia, Pa., has moved its New York offices to 40 West 40th St., New York 18.

James E. McDonald, general sales manager for the Edward Valve & Mfg. Co., East Chicago, Ind., died February 25. He had been with the organization since 1917.

T. C. Davis, formerly manager of industrial sales, has been named vice president in charge of mechanical sales planning and experimental sales for the Day-



ton Rubber Mfg. Co., Dayton, Ohio. New York District Manager T. D. Slingman will become vice president in charge of mechanical sales. Also named to new positions are Superintendent H. S. Mooradian, now vice president in charge of production and Chief Chemist Joseph Rockoff, vice president in charge of development.

C. E. Kraehn has been appointed to assist V. H. Peterson who is in charge of all sales activities of the Baldwin Locomotive Works, Philadelphia, Pa. He was formerly with General Electric with whom he was associated for 24 years.

(Continued on page 264)

CUB High-Production
AIRBRUSH

- Lightweight, perfect balance, enable operators to work longer hours at top speed.
- Superior performance speeds production rate; assures quality finishing.

*Finish
the Job*

FASTER

with PAASCHE
AIRPAINTING
Equipment

Proof that Paasche Airpainting Equipment steps up production—saves man-hours—improves quality, is evidenced in hundreds of factories—in shipyards—in aircraft plants—and on those big construction painting jobs.

Investigate Paasche time-saving Automatic Units—safer, cleaner Water Wash Booths—the High Production Airbrush illustrated—and other equipment for faster finishing.

Write for full information and literature. Paasche Airbrush Co., 1954 Diversey Parkway, Chicago 14, Illinois.

Paasche Airbrush (Canada) Ltd., 110 Elm Street, Toronto.



**NO CUSTOMER
COMPLAINTS**
... *shipments move when*

MARSH STENCIL MARKED

Shipments worth *millions* are undelivered annually due to improper marking. The *proper* way to mark shipments for *sure*, prompt delivery is to *Stencil-Mark* the address. Unlike tags or labels, rough handling or weather can't remove a Stencil Marked address. Nor can it be misread by hurried handlers. More than avoiding customer delivery complaints, Stencil-Marking is economical... saves up to \$600 annually in shipping room time. No experience is required. You simply cut a stencil, place it on *any* type of shipment, stroke with a Marsh Stencil Brush... and it's addressed... *legibly, accurately, permanently*. Write for free booklet and prices.

MARSH STENCIL MACHINE CO.
57 Marsh Building Belleville, Ill., U. S. A.

MARSH

Use these Marsh Stencil Products!

STENCIL CUTTING MACHINES. Three sizes, $\frac{1}{8}$ ", $\frac{3}{8}$ " and 1" to meet Government specifications. Of newest design, Marsh Stencil machines have Hardened Dies and Quick-Replacement Punches.

FOUNTAIN STENCIL BRUSHES. Handle holds the ink. Button control flow. Marks 500 stencils without refill. Tips replaceable.

FELT TIP MARKER. Writes or prints, addresses, signs, etc.

STENCIL INKS. Colors: Black, Red, White, Blue, Yellow, Green. For marking wood, paper, cloth, metal. Bright, permanent waterproof. Meets Government specifications.

OIL BOARD. For cutting stencils. Makes clean, sharp stencils, good for several thousand marks.





Knocking a chip off General Sherman's shoulder

...with an Armour Fibre Combination Sanding Disc!

JUST a hair-line scratch on a vital tank part can start a fatal fracture. Yet, in battle, every working part absorbs brutal punishment... must withstand the severest strains. That's why fighting American tanks... like the General Shermans... can not leave the factories until valves, gears, rods are ground to a glass-like smoothness.

From treads to turrets American tanks are fitted with a watchmaker's precision. Armour's Fibre Combination Sanding Discs are helping to *get* this flawless fit by polishing parts precisely and quickly!

Coated with hard, razor sharp aluminum oxide, Armour's Discs cut more evenly, with less heat, in less time! Aluminum Oxide's great strength and

keenness results from processing in electric furnaces.

You can depend upon Armour's Discs because each particle of grit is cemented... for keeps... to the cloth and fibre backing with a special Armour glue.

Find out... today... how Armour's full line of abrasives can help lick your production problems. Call your Armour branch or write to Armour Sandpaper Works, Chicago. We'd welcome the opportunity to talk with you about your abrasive problems—because we believe there's an Armour abrasive tailor-made to do a job faster and more efficiently.



ARMOUR SANDPAPER WORKS

Division of Armour and Company

1355 WEST 31ST STREET • CHICAGO, ILLINOIS

(Continued from page 262)

Dwight R. Means has been named assistant to the vice president of the Co-



lumbia Chemical Divn. of Pittsburgh Plate Glass Co., Pittsburgh, Pa. Prior to his appointment, Mr. Means was technical director.

P. L. Datoe has resumed his duties as manager of the Central Divn. of Acme Steel Co., Chicago, Ill., after spending some 15 months in the Tank, Automotive Center Office of the Chief of Ordnance,



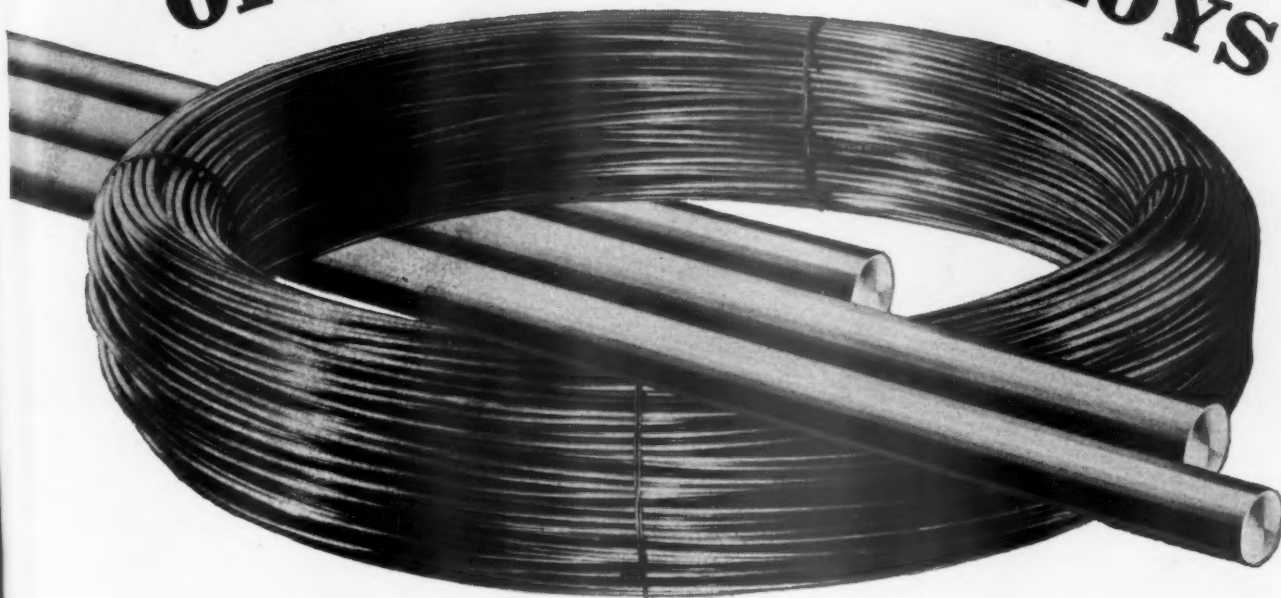
Detroit, Mich. He helped organize the Packaging Section of the center where studies were conducted and specifications prepared for preservation and packing of tanks, vehicles, and parts.

Dr. John M. Schweng has been appointed Director of Bacteriological Research and chemical research engineer for Turco Products, Inc. Dr. Schweng has to his credit advances in the catalytic



cracking of petroleum crude, and in the development of protective coatings for aluminum and magnesium alloys. He is a member of The American Chemical Society.

Pittsburgh gives you "Magnaflux Quality" in OPEN HEARTH ALLOYS



Quality *alloy steel* is simply *good sound steel* to which regular alloying materials have been added in definite quantities, under rigidly controlled conditions and with adequate skill, to yield specific and uniform analyses and characteristics.

Pittsburgh Steel is past master at the art of making *good basic open-hearth steel*; and what amounts to decades of added experience, crowded into a few short years by the demands of war, has taught equal facility in the mastery of open-hearth *alloy steels*.

Hence the quality of Pittsburgh *Alloy*

Steel Bars and Wire of comparable analyses, is surpassed by none . . . a fact readily proved by Magnaflux inspection!

Pittsburgh specializes in light *Alloy Bars* and all sizes of *Alloy Wire* in coils or straight lengths, cold drawn from this "Magnaflux quality" open-hearth steel.

New and previously undreamed of uses for open-hearth alloy steels will result from this technological progress in products manufactured from bars, wire and tubing.

Your inquiries will have the prompt consideration of our technical staff. Write

PITTSBURGH STEEL COMPANY

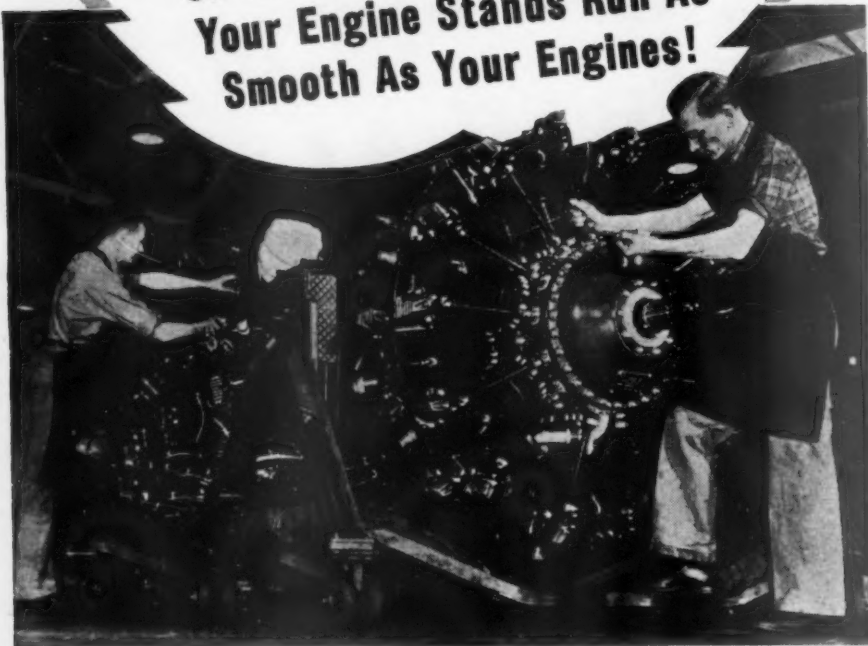
1671 GRANT BUILDING, PITTSBURGH, PA.



Pittsburgh ALLOY STEELS

Billets, Bars, Wire and Tubing; also Carbon and Stainless Steels

**On BOND AVIATION CASTERS
Your Engine Stands Run As
Smooth As Your Engines!**



THESE WRIGHT CYCLONE 14-cylinder engines—for use in such planes as the Curtiss Helldiver, the Martin Baltimore and the North American B-25

Mitchell—run as smooth as a kitten's purr! And they move just as smoothly from station to station in their progressive line assembly—because engine stands are equipped with Bond Dual Wheel Casters.



**BOND DUAL WHEEL CASTER ALSO
MADE WITH OSCILLATING AXLE.**

Distributes the load evenly on both wheels. Sudden tilting is eliminated . . . shock is reduced . . . damage prevented. Double ball race construction. Pressure lubricated throughout. Can also be supplied with swivel lock.

Today's Bond Leaders: WAR BONDS AND BOND CASTERS

BOND FOUNDRY & MACHINE COMPANY, MANHEIM, PA.

**Send for
FREE FOLDER!**

Bond Folder R-39 gives complete facts about Bond Aviation Casters. Write for your free copy today.



★ Reg. U. S. Pat. Off.

**MERIT AWARDS
ARMY—NAVY—MARINE**

American Chain & Cable Co., Inc., Wilkes-Barre, Pa. Plant of Hazard Wire Rope and American Cable Divisions. Rear Admiral Wat T. Cluverius pre-



George C. Gregson, manager of plants, American Chain & Cable Co., Inc., accepts Army-Navy "E" flag from Rear Admiral Wat T. Cluverius,

sented an Army-Navy "E" flag to the company for efficiency and excellence of production. It was accepted by George C. Gregson, manager of plants. "E" pins were presented to four representative employees by First Sgt. Harry D'Ortona, U.S.M.C. veteran.

Osborn Mfg. Co., Cleveland, O. Army-Navy "E" pennant.

Pittsburgh Piping & Equipment Co., Pittsburgh, Pa. Army-Navy "E."

Bryant Electric Co., Bridgeport, Conn. Army-Navy "E" flags were presented to both the Wiring Device Division and the Plastic Division of the company.

Philco Corporation, Storage Battery Divn., Trenton, N. J. Third White Star added to Army-Navy "E" award.

Cochrane Corporation, Philadelphia, Pa. Army-Navy "E."

Underwood Elliott Fisher Co., Bridgeport, Conn. Plant. Army-Navy "E."

DuPont de Nemours and Co., Inc. Second and White Star to the "E" flags awarded to nylon plants at Martinsville, Va., Seaford, Del., and Wilmington, Del.

Edward Valve & Mfg. Co., Inc. East Chicago, Ind. Second Gold Star to Maritime "M" Pennant.

Package Machinery Co., Springfield, Mass., Army-Navy "E" award.



Picked FOR THE JOB!

HAND-TO-HAND FIGHTING is indispensable, even in this most mechanized of all wars, to complete and final victory . . . and no item of equipment is more definitely built to fit its particular job than the deadly bayonet!

So it is with Wasmer Tru-Fit Lag Screws, Bolts and Nuts, Cap and Set Screws, Lock Washers, etc. . . . each is specifically designed and built to fit the job it has to do.

Where the job is one of holding wood to wood, or steel to wood, on pontoon bridges,

railroad tressels, ships, truck bodies, or the thousand-and-one other vital items of war equipment, involving wood planks and timbers, Wasmer Tru-Fit Lag Screws are built to fit the job, with clean-cut, accurate threads . . . precision pointed . . . full shank . . . square, snug-fitting heads for speedy assembly.

With the highest man-hour production in the history of the Company, Wasmer workers and facilities are exceeding all previous production records as their contribution to the final Victory!

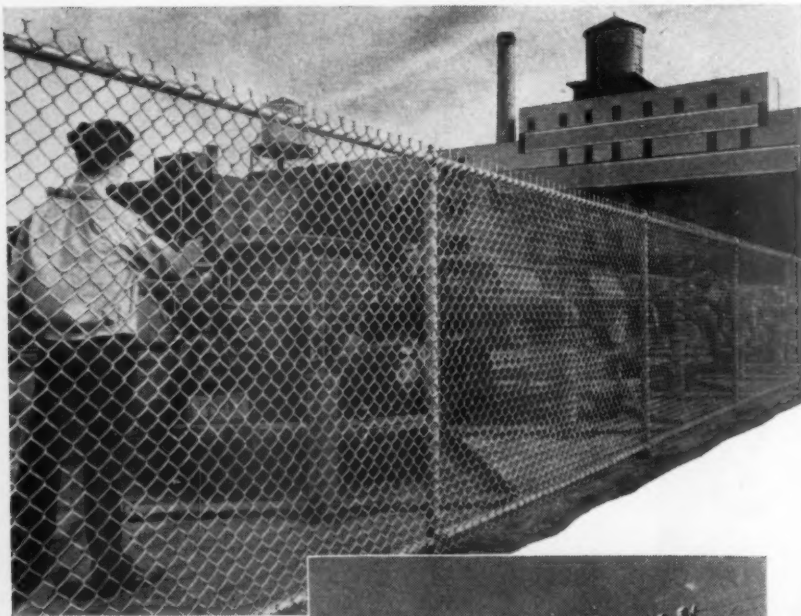
WASMER

BOLT & SCREW CORP.

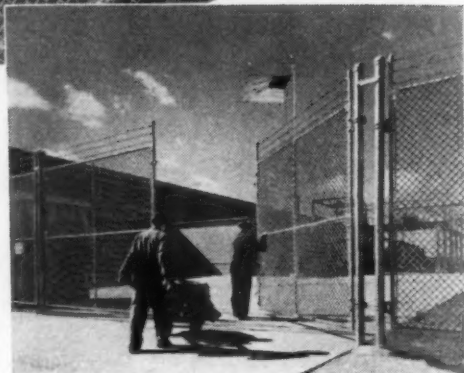
13600 ATHENS AVENUE, CLEVELAND 7, OHIO, U. S. A.

PAGE FENCE *-Since 1883*

• AMERICA'S FIRST WIRE FENCE •



*Pattern
for
Tomorrow*



• When wartime pressure lets up, many plans for a better tomorrow in industry will have been determined. Do your plans include protection against malicious trespassers, vandals, fire fiends and thieves? Are you looking forward to days of greater safety? Safeguarding lives and property is the major function of sturdy, long-lasting Page Chain Link Fence. Rendering skilled, responsible engineering and erecting service, and fence repairing and moving, are the functions of long-experienced, local Page Fence firms. Write for FENCE FACTS and we will send name of nearest Association member. Address PAGE FENCE ASSOCIATION, Headquarters: Monessen, Pa.

PRODUCT OF PAGE STEEL & WIRE DIVISION—AMERICAN CHAIN & CABLE COMPANY, INC., BRIDGEPORT, CONN.

Adjusting Purchase Plans

(Continued from page 99)

Mr. Denoyer, Assistant to the Purchasing Agent, entered the Company's service in 1916, in the General Office Stores Department, and after a year there went into the Army for World War I, where he became a Sergeant in the Air Corps. After honorable discharge and return to the Company, he was assigned to the Purchasing Department, where he served as a tracing clerk in 1919 and 1920. He was then away for two years substituting for his father, an automobile dealer. Returning to the Public Service Purchasing Department in 1922, he was successively Stock Record Clerk, Tracing Clerk again, and Buyer, until 1925, when he became Chief Clerk, from which position he was promoted in 1927 to Assistant to the Purchasing Agent.

During this program he carried on after-hours study, was graduated from the Coyne Electrical School, Chicago, and in 1933 took the Public Service Company President's Training Course in Management.

When Mr. Denoyer had completed twenty years of service with the Company, Mr. Reynolds and all the others in the Purchasing Department presented him with a signed scroll, which hangs above his desk, testifying to their appreciation of his part in the department's operations.

J. J. Lancaster, the other Assistant to the Purchasing Agent, started to work for the company as an office boy in July, 1918, and was transferred to the Purchasing Department in January, 1925. He was promoted in January, 1927, to Buyer; in January, 1928, to Chief Clerk, and in August, 1932, to his present position. At 39, this purchasing man is the youngest in the entire company organization to have been in its service for twenty-five years.

G. A. Lindblom, Chief Clerk of the Public Service Purchasing Department, was for two years with a materials testing laboratory, before entering this company's service. He began work there in January, 1925, in the Purchasing Department. His first job was installing a purchase and cost record file. He has held various buying jobs in the department, and was advanced in 1932 to his present position, in which, besides being Chief Clerk, he is at present cable and wire buyer.

A well systematized purchasing department is a good place in which to work and to grow.

THE *HOW* AND *WHY* OF

PROPER SELECTION AND USE OF SOCKET WRENCHES . . Data Sheet No. 24

● Chief advantage of Detachable Socket Wrenches is that they permit the operator to *assemble a special wrench* for any particular job. They are inherently safer than open-end wrenches because they grip *all* rather than only two sides of a nut. They are faster when Speeder, Extension-Driver or Ratchet Handles are used. The proper Williams' "Supersocket" assemblies to use for various typical applications are shown.



DELICATE WORK. This thin, straight-walled Midget "Supersocket" with Extension-Driver and Sliding T Handle is fast and sure in these cramped quarters where an ordinary wrench could not even reach the nut.

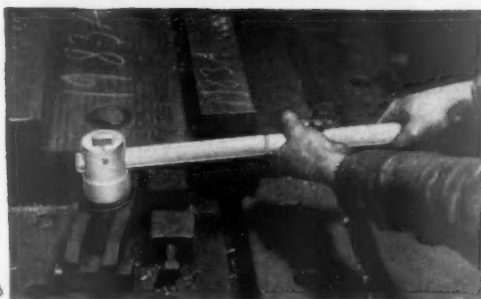


TIME SAVING. The operator assembling this machine quickly tightens a long row of cap screws while standing erect. The Extension Bar between Speeder Handle and Socket permits continuous rotation since handle clears all obstructions.

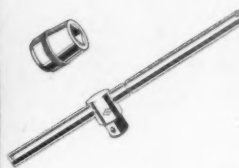
Sold by Leading Industrial Distributors Everywhere
J. H. Williams & Co., Buffalo 7, N. Y.

WILLIAMS

DROP-FORGED TOOLS



POWER. Tremendous leverage combined with positive grip result from this Extra Heavy Duty "Supersocket" assembly. These sockets are cross-drilled, thus bringing the Sliding Handle close to the work, minimizing the tendency to tip when Socket is used near the end of handle.



HAZARDOUS JOBS. Working from a ladder, this millwright not only gets at an awkwardly-placed nut with this Standard "Supersocket" combination but he can apply heavy leverage without danger of the wrench slipping and throwing him off balance.



OBSTRUCTIONS. With this "Supersocket" Ratchet and Socket, the mechanic "gets around" obstructions that otherwise would have to be removed to make an adjustment. A 30° swing is all that is needed to rotate a nut with this Handle. "Supersocket" Extensions are likewise very helpful in getting at hard-to-reach nuts.

| TOOL HOLDERS | "C" CLAMPS | LATHE DOGS | WRENCHES OF ALL TYPES | PIPE TONGS | THUMB NUTS SCREWS | HOIST HOOKS | EYE BOLTS |
|--------------|------------|------------|-----------------------|------------|----------------------|-------------|-----------|
| | | | | | | | |

S
P
A
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Spartan

HACK SAWS AND BAND SAWS

Under present conditions, you need saws that are manufactured and heat-treated "to take it"!

You "Cut Cutting Costs," too, with Spartan Hack and Band Saws.



SPARTAN SAW WORKS, Inc.
SPRINGFIELD, MASSACHUSETTS, U. S. A.

DARNELL

CASTERS



*extra Dependability,
Durability, and Service*

DARNELL CORP. LTD.
LONG BEACH, CALIFORNIA

60 WALKER ST. NEW YORK N.Y.
36 N. CLINTON, CHICAGO ILL.

GRAND QUICKCET



SETTING THE PACE ON EVERY PRODUCTION FRONT

Saving 90% of clamping time—new designs for high speed production work, one hand operation. Non-creep replaceable grips. Proof-tested alloy steel construction of forged clamp capacity. Quikcet 4 second clamp will hold tight even on tapered surfaces without creeping. Fast ratchet rod action under powerful fulcrum leverage. Screws, rods and handles copper plated against welding spatter.

A complete line of modern time-saving clamps—both malleable iron and alloy steel. Our new 32-page catalog illustrates and describes these production clamps in detail. A copy is yours for the asking. Write today.



GRAND SPECIALTIES CO.
3115 W. Grand Ave. Chicago, Ill.

Wartime Purchasing Convention in England

(Continued from page 101)

discussion on the various subjects of operating.

Of course, to them, the important subject was how we did our purchasing here in the United Kingdom.

Wartime Procedure

It was quite difficult to explain to these hard-headed purchasing men and women of England just how we purchased here. That we had to find the source of some supplies, furnish technical details for those items not of a common or general nature, and had to assure the flow of raw material for manufacture where such raw material was furnished from the United States, could be readily understood by all of them. But when they found that all of the actual purchasing, i.e. the *detail* of the writing of the purchase order or contract, was done by a British Ministry, and that the cost of the goods was covered by the King and not by Uncle Sam, these people were naturally astounded.

Reverse Lend-Lease

Of course it was necessary to explain that this was done to avoid competition, and also done within the framework of the agreements arrived at between their illustrious Prime Minister and our President, by which it was understood that each Nation could contribute in men, money and materials. The furnishing of materials where obtainable from British sources in the United Kingdom was an important part of British effort, for every item furnished represented a saving of transatlantic shipping, so important in the war. The payment by the British government of the cost of the goods was in line with the agreement, and represented a credit on the British side of the ledger against Lend-Lease. Reverse Lend-Lease it was termed in the beginning. Reciprocal Aid we Americans term it officially. Mutual Aid, the British call it.

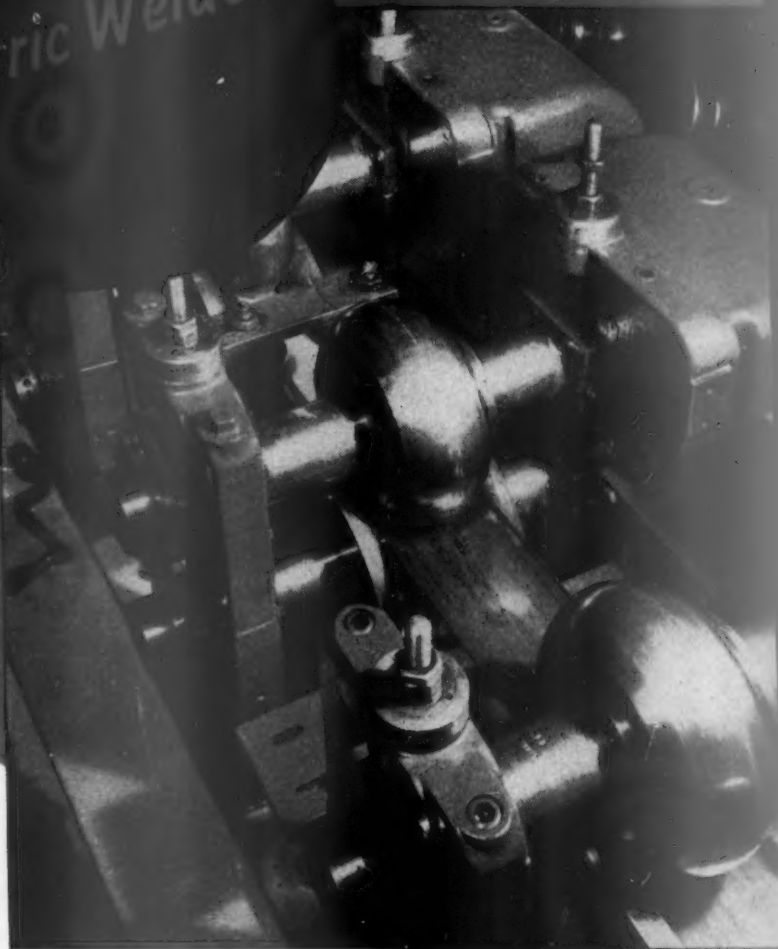
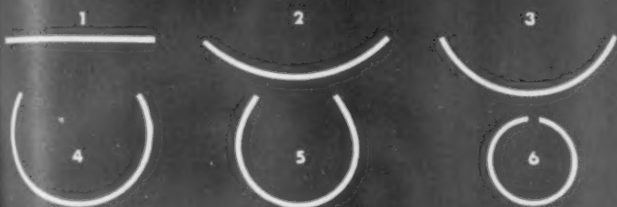
The fact that we had obtained such a huge quantity of goods by volume as well as in money value was quite staggering to these gentlemen. They could realize, then, the other reason why most purchases are made by the various British Ministers — to avoid competition and prevent inflation — for the impact on their market of Americans

(Continued on page 272)

No Strain

in Forming Talon's Electric Welded

Steel Tubing



These forming rolls shape the flat, strip steel into easy-to-fabricate Talon's Electric Welded Steel Tubing.

Flat, accurately trimmed, carefully selected strip steel passes through this series of eleven sets of forming rolls and is formed progressively into round tubing. Properly engineered pass design prevents overstraining and resultant injurious stresses.

Then the material moves into position under the welding unit and the two edges are joined by electric resistance welding. Subsequent operations include bright annealing (when application demands this quality), straightening, cutting to length, **EXACTING TESTING**, careful inspection, and proper preparation for shipment to your plant.

Facts About Easy-to-Fabricate Talon's Tubing

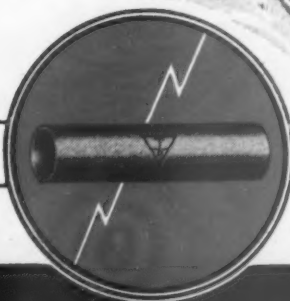
You can fabricate Talon's Tubing by all the standard methods. The section can be changed by beading, flanging, swaging, bending, etc., to meet an endless variety of design requirements.

It can be joined by innumerable methods, either mechanical or welded. If you plan to use Steel Tubing for your wartime or your peacetime product, you'll find Talon's Tubing easy to fabricate.



Hundreds of miles of Talon's Tubing have been used for the "invasion lines" to carry gasoline, oil, and water to our mechanized forces in the combat areas. Lightweight for ease and speed of placement in the field, great strength and flexibility to withstand the shocks of bombing and shell fire, were the requirements.

PRESSURE



MECHANICAL

TALON . . INC.

STEEL TUBE DIVISION

OIL CITY, PENNA.

Wartime Purchasing Convention in England

(Continued from page 270)

wanting something, and ready to pay cash in the good old American way, would have caused havoc to their economic system.

New Contacts

While most of us had visited many manufacturing plants over here in Britain, we had done so only to follow through on the detail of some item which we ought to have produced over here, and met generally with production people. Or we were in the hands of the sales manager or general manager. Now we have invitations from many of the largest enterprises in Britain, including many of the large public utility concerns. Visiting these plants in the company of the Purchasing Officer, and with many of us who are normally in the business of purchasing, should be of tremendous interest and of great benefit to all of us.

These people are grand fellows. I admire their way of living—their way of doing things. They are grand fellows. They have different ways of doing many things, and somewhat different manner of expressing themselves. So many things are so very different, that it takes some little time in order to do business with these people. You may have heard of my experience with the garbage can—known over here as the “dustbin.” We couldn’t get any garbage cans in this country until we called them “dustbins.” And in one article or another you have read of many other differences.

A Determined People

I’ve been here now almost two years, but the other day found myself at a loss in talking to one of these Purchasing Officers. I told him that the 3,850 items which we had purchased here up-to-date covered the whole range of every known kind of supply—everything from A to Z. He didn’t understand. A friend interposed and asked whether I meant A to Zed. There is no Z here—it is Zed. And Zed is right, in their viewpoint. Maybe it is. They are determined people here—as determined as the cartoons and stories paint them. Stubborn, some people say. I think that is the characteristic which kept them going in the lowest days of this war.

THE CHAMPION DIAMOND

is a dependable beacon to BETTER LIGHT

CHAMPION
40 W
DAYLIGHT

The pressure of war production has already brought about keener appreciation of the value of more and better light. The value of the Champion Diamond mark on every lamp addition and replacement is therefore appreciated all the more.

The four points of the Diamond stand for:

1. CHAMPION QUALITY—backed by forty-four years of specialized experience and a guarantee to equal or exceed Federal Specifications.
2. CHAMPION SERVICE—including trained experts in the field to render prompt assistance on all lamp or lighting problems.
3. CHAMPION ECONOMY—assuring lowest costs, lamp for lamp, lighting efficiency considered.
4. CHAMPION DISTRIBUTION—through competent industrial suppliers equipped to meet individual needs promptly and efficiently.

Fluorescent and Incandescent

CHAMPION LAMP WORKS
Lynn, Massachusetts

A DIVISION OF CONSOLIDATED ELECTRIC LAMP CO



The Austin Company—Architect, Engineer, Manager

Nearly a million square feet of K&M "Century" Apac in this mighty aircraft plant!

BUILD fast... build to last... build NOW—with K&M "Century" Apac. That has been, and continues to be, the watchword in a remarkable volume and variety of wartime construction.

Millions of square feet of this adaptable all purpose Asbestos-Cement structural sheet material have speeded to completion practically every type of building for war.

In the striking modern aircraft plant illustrated, "Century" Apac helped save 30,000 tons of critical war metals. This is one of the largest timber-framed structures in the world—and "Century" Apac was used for all exterior sidewalls, including the assembly building, which is 3,000 feet long!

"CENTURY" APAC IS PROMPTLY AVAILABLE TO YOU NOW WITHOUT RESTRICTION! It's easy to handle, cut and

Our Ambler plants proudly fly the Army-Navy "E" flag—an honor awarded K&M employees "for outstanding production of war materials."



fasten with nails or screws. It's fireproof and weatherproof—requires practically no maintenance. It's moderate in cost. Build better now with "Century" Apac!

Plan on using this modern structural sheet for factory and other building construction, as roofing, siding, office panelling, fire resistant sheathing in shops and stock rooms, linings for elevator casings and shower stalls—for repairs, small utility buildings and temporary structures. Write for information.

**KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA**



The need for dependable precision tools has been so overwhelming that Starrett toolmakers of necessity concentrated on those of greatest usefulness and stamina.

Starrett's "wartime" line comprises the tools that have proved themselves under today's extreme service demands. These tools are going to provide the finest possible nucleus for the great re-tooling job of post-war industry. Starrett Tools will not be found wanting when that time comes.



Now with Service Star

THE L. S. STARRETT CO • ATHOL • MASSACHUSETTS • U. S. A.

World's Greatest Toolmakers

STARRETT

PRECISION TOOLS • DIAL INDICATORS • GROUND FLAT STOCK
HACKSAWS • METAL CUTTING BANDSAWS • STEEL TAPES

Accurate Stock Records

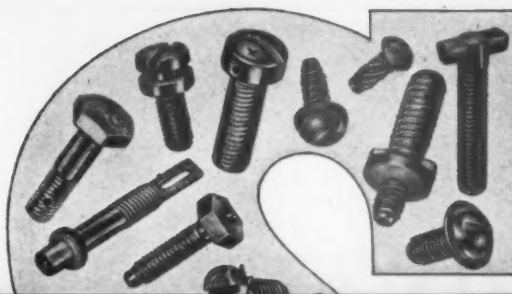
(Continued from page 87)

It is apparent from a study of this procedure that its simplicity and its success depend basically upon the maintenance of complete and accurate stock records. But Delta has found that this, too, can be accomplished without unduly complicating the problem. It has, in fact, been systematized to the point where it is competently handled by a staff of five people, and the perpetual inventory covers not only raw materials, parts, and castings, but finished stock as well, plus the charge-out of materials to work in process until the time when they become finished stock and are transferred to that account. Management has a pretty good idea, at every stage of the process, not only what the stock situation is, but where and how the materials are being used.

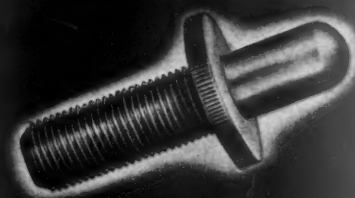
Again it is a case of avoiding the use of special forms, and of making one form do a complete job—doing double duty, it would be called in some organizations. For the work tickets of the production department are tied into the stock records just as stock records are tied in with purchasing. Two basic policies contribute to this result. One, which has already been noted, is the policy of designating every part by its identifying number. The other is the practice of having work tickets travel with the job from start to finish, attached to the materials which they concern, so that they start with the issuance of stock and come back in the end to stock records as the production records of work completed becomes the authorization to deduct certain quantities from work in process and are transferred to the finished stock inventory. And since the production records show the number of pieces—good, bad, and scrap—by actual count at the point of operation, the stock record is no theoretical cal-

(Continued on page 276)

**BUY
WAR
BONDS**



SCOVILL SPECIALIZES IN COLD-FORGED FASTENINGS TO FILL YOUR SPECIFIC REQUIREMENTS



"Cold-forging" — proof #18
... more each month

COLD-FORGING skill mastered that job illustrated above—it was cold-forged by Scovill specialists. Many buyers of special designed fastenings believed their job could not be cold-forged until they were shown just what cold-forging ingenuity could accomplish.

That is where Scovill comes in. It is our job at Scovill, not only to serve you effectively by helping select the exact cold-forged fastenings that will best fill your specific requirements, but also to advise you just what fastenings can and should be cold-forged.

To serve you effectively—we must understand your particular problems thoroughly—help you

to choose between "standard" and "special" fastenings—advise you candidly whether cold-forging can and should be employed to obtain the best results—design, or help you design, the fastening device most advantageous to your assembled product—deliver your job for minimum money—materials—motions.

Save time, trouble, money—as many Scovill customers have done—by calling in one of our Fastenings Experts from our nearest office to plan your fastenings when the product is still in the design stage.

SCOVILL MANUFACTURING COMPANY

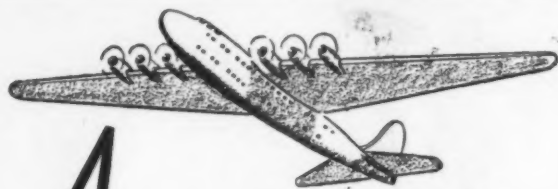
WATERVILLE SCREW PRODUCTS DIVISION

WATERVILLE 48, CONN.



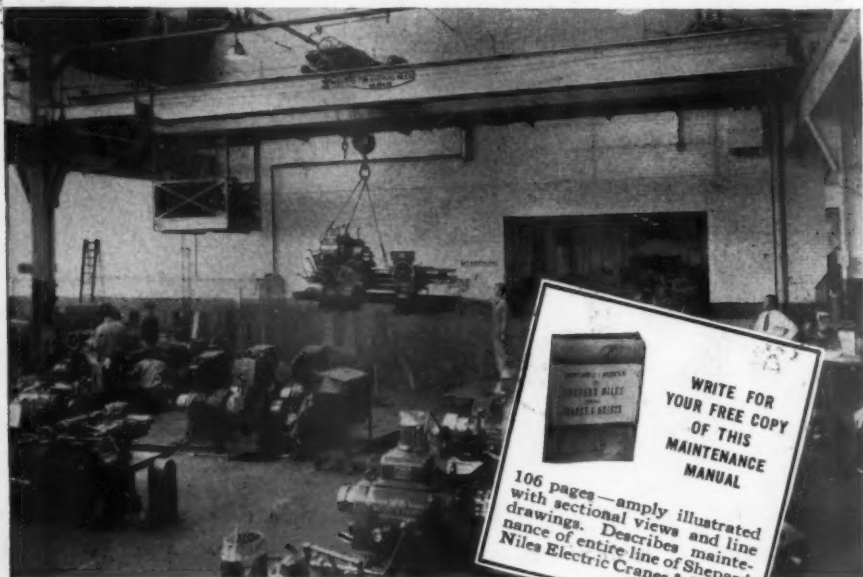
TEL. WATERBURY 3-3151

NEW YORK, Chrysler Building • DETROIT, 6432 Cass Avenue • CHICAGO, 1229 W. Washington Boulevard • PHILADELPHIA, 18 W. Chelton Avenue Building
PITTSBURGH, 2882 W. Liberty Ave. • SYRACUSE, Syracuse - Kemper Insurance Bldg. • LOS ANGELES, 2627 S. Soto St. • SAN FRANCISCO, 434 Brannan St.



Air transport

minus the wings



Like the famed air transport planes of the armed services, Shepard Niles Overhead Electric Traveling Cranes depend upon faultless engineering and rugged construction for their ability to "pick-up-and-go" with heavy loads.

While tremendous stresses are put upon the crane girders, the heart of the entire installation is the crane trolley, or hoisting unit. Here is where the going is *really* tough. And *here* is where the time-proven, Shepard Niles - developed features, such as the "Balanced

Drive" (where stresses are evenly distributed through the hoisting unit by means of the planetary gearing principle) and the "bath of oil" system (in which the entire gear train operates in a bath of oil) remove the danger of excessive wear.

Ask one of the Shepard Niles representatives in your locality to show you how these and other equally sound principles can be applied profitably to your problem.

Overhead Electric Traveling Cranes are made in either welded or riveted box girder construction. Capacities: Welded box girder, up to 15 tons; riveted box girder, up to 450 tons.



Shepard Niles

CRANE & HOIST CORPORATION

462 SCHUYLER AVE. • MONTAUR FALLS, N. Y.

Accurate Stock Records

(Continued from page 274)

culatation, but adjustments are promptly made on the basis of the actual report.

As a matter of precaution, the purchasing department may re-check in stock the items shown on their work sheets, three weeks or so before the materials are scheduled for assembly, while there is still time to do some intensive expediting and secure delivery. And it has been found expedient to have a practical foundry man, who also supervises the building of new patterns, devote a portion of his time to following-up the progress of castings in accordance with the scheduled delivery dates from outside vendors. But on the whole, the record of smooth and uninterrupted production in this plant is striking evidence that the system of stock control and purchasing has been exceedingly effective in feeding the machine tools and assembly lines with the materials that are needed, when they are needed.

1 1 1

Classifying Commodities

(Continued from page 106)

plies procured. In some quarters there occasionally appears to prevail the impression that any commodity or group of commodities procured in large quantity should be classified in a separate class in order that money values of purchases or issues may be readily determined.

It will be apparent that such a criterion is not a sound one for the determination of a storage and issue classification. The needs to be served are so multifarious and so evanescent that they should not influence classification. For example, one individual or group may desire to know the entire expenditure for Portland Cement. Another may desire to ascertain expenditures for a particular variety of such cement, such as high-early-strength, moderate-heat-of-hardening, pozzolana or sulphate-resisting. One investigator may be interested in the total expenditure for foods, another in the expenditure for flour, for meats, or for canned fruits or vegetables. One may desire to ascertain the total expenditures for gasoline, another may insist upon separate tabulation of each octane rating.

(Continued on page 278)

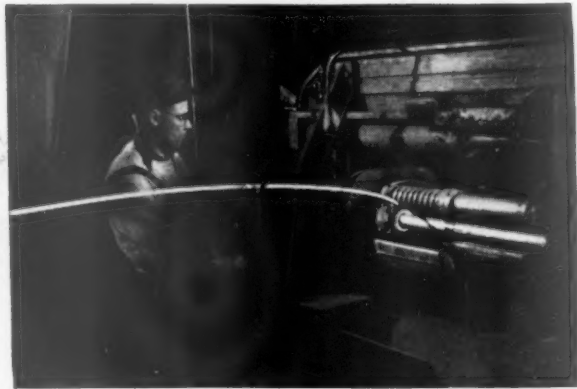


"HOW DOES MUEHLHAUSEN MAKE THOSE SUPER-SIZE SPRINGS?"

Well—it's this way. Those big babies must be coiled hot, to extremely close tolerances...and produced in quantity at P-38 speed. It's specialized work that demands very specialized equipment. So—Muehlhausen has one huge plant totally devoted to hot forming. It is all conveyORIZED. Production is governed by a central laboratory. The quenching tanks are the size of swimming pools, and skyscraper-like shot blasters give springs clean, lustrous finish and added life.



Automatic tapering of bar ends prior to coiling



Precision hot-coiling springs on automatic equipment



Precision grinding squares both spring ends at once



Shipping finished springs in carload lots

To improve product performance, use

**MUEHLHAUSEN
Designed
SPRINGS**

To really appreciate how your production schedule and product can benefit by these extensive facilities, call Muehlhausen in on your next spring job. Write for new booklet on hot-coiling springs.

MUEHLHAUSEN SPRING CORPORATION
Division of Standard Steel Spring Company
675 Michigan Avenue, Logansport, Indiana



ANY AIR EXPRESS shipment that's packaged, labeled and ready to go **A...SHOULD GO!** Don't let it sit! Call AIR EXPRESS right away...instead of waiting for "routine" afternoon pick-ups. Your shipment thus avoids end-of-the-day congestion when Airline traffic is at its peak. That's the secret of getting fastest delivery! **SHIP WHEN READY!**

And to cut costs—AIR EXPRESS shipments should be *packed compactly* but securely, to obtain the best ratio of size to weight.



A Money-Saving, High-Speed Tool For Every Business

As a result of increased efficiency developed to meet wartime demands, rates have recently been reduced. Shippers nationwide are now saving an average of more than 10% on Air Express charges. And Air Express schedules are based on "hours", not days and weeks—with 3-mile-a-minute service direct to hundreds of U. S. cities and scores of foreign countries.

WRITE TODAY for "Vision Unlimited"—an informative booklet that will stimulate the thinking of every executive. Dept. PR-4, Railway Express Agency, 230 Park Avenue, New York 17, N. Y.

AIR EXPRESS

Gets there FIRST

Phone RAILWAY EXPRESS AGENCY, AIR EXPRESS DIVISION
Representing the AIRLINES of the United States

Classifying Commodities

(Continued from page 276)

It is not necessary that the classification be modified to meet these needs. The arrangement of the Federal Standard Stock Catalog leads itself readily to the machine tabulation of money values of supplies procured or issued. Itemized tabulation renders practicable any combination desired, and serves to meet all the special needs which have been indicated. In addition, some use has been made by certain activities of what are designated as article stock numbers. These numbers are assigned in accordance with the alphabetical-numerical arrangement and apply not to items, i. e., to a single color, size, etc., of an article, but to an article as a whole, i. e., to a collection of items within a class, such as flags (all nations); hats, white (all sizes); pigments in oil (all colors); screws of one kind or type (all sizes).

This arrangement permits the ready tabulation in terms of the Catalog classification of the total money values of purchases or issues of such groups of supplies or the material requirements for the fabrication of any required quantity of such commodities.

While originally designed with a view to meeting the needs of the various departments and establishments of the Federal Government, the Federal Standard Stock Catalog storage and issue classification is equally adapted to the requirements of State or municipal supply systems as well as to such commercial activities as public service corporations. The Standard Stock Catalog of the Department of Purchase of the City of New York, issued in 1941, utilizes this classification with minor modifications designed to meet special conditions arising in connection with the supply system of that city.

An Aid in Purchasing

The major purpose of the procurement classification is to provide a commodity grouping for use in Government purchasing. It also provides a basis for specialization in the organization of procurement activities, interdepartmental, departmental, or local. The plan is flexible, in that combinations or subdivisions of groups may be made as found desirable to provide for contraction or expansion in the transaction of Government business.

(Continued on page 280)

Time—
2.46 MIN. SEC.



From buyer to burner, it's two minutes and forty-six seconds via telephone and teletype...proof of our organization's time-reducing methods and better ways of doing things.

Why not avail yourself of this quick, efficient, friendly service?

LEVINSON STEEL SALES CO.

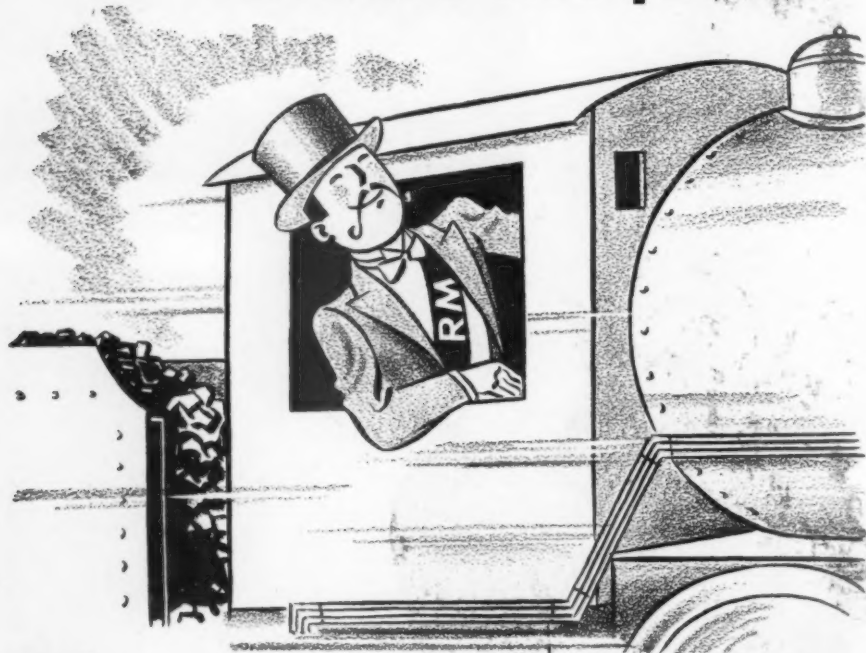
33 PRIDE STREET · PITTSBURGH 19, PA.



**Warehouse and Specialty
Steel Products**

R/M PACKINGS

throttle the joints



Today's locomotives are typical users of R/M packings. Steam connections, valves, pistons, air-brakes are some of the spots where R/M serves to speed supplies—when extra wearability means many more miles of service.

Railroads and other vital industries must have first call on R/M production in time of war, but we will continue to try to serve your requirements through your regular mill-supply house.



INDUSTRIAL SALES DIVISION
RAYBESTOS-MANHATTAN, INC.

MANHEIM, PA.

BRIDGEPORT, CONN.

NORTH CHARLESTON, S. C.

PASSAIC, N. J.

Makers of Packings for Every Industrial Use



Classifying Commodities

(Continued from page 278)

In general, the utilization of the procurement classification has been mainly by procurement offices in the grouping of commodities in purchase schedules or invitations for bids. Inasmuch as periodical replenishment dates are generally set with reference to classes for storage and issue, the organization of purchase schedules by such groups generally extends to the scope of the commodity classes for storage and issue which are being replenished at one time, rather than to the entire range of the requirements of the department or establishment concerned.

Federal Specifications, Section IV of the Catalog, are classified according to groups for Procurement. The designating symbols of the Federal Specifications are made up in each case of the letter designation of the Group for Procurement within which the commodity falls, the initial letter of the principal word of the nomenclature of the commodity, and a serial number so chosen as to preserve alphabetical-numerical arrangement of numbers and titles of Federal Specifications within each group.

1 1 1

Spending and Saving

(Continued from page 112)

The laws of many states require that institutional products shall be used by the state and its political subdivisions in preference to comparable commodities purchased in the open market. Communities forced to buy these products frequently complain of inferior workmanship, design and quality. These defects can be corrected, in part, by the requirement that industrial products must be manufactured in accordance with the standards and specifications established in the purchase division. Inspection should be provided, and inferior products disposed of only as seconds, at reduced prices.

The selling price of institutional products should be controlled on the basis of cost of manufacture, but the price should not be in excess of competitive market price for goods of similar quality and workmanship, and the element of profit should not receive undue consideration. Claims

(Continued on page 282)

"AMERICAN PHILLIPS SCREWS
Are Helping Us Meet Our War-Time Schedules
...and they'll lower the cost
of our Peacetime Products"

American Phillips Screws are saving an average of 50% of war-production assembly time for two reasons:

1. *Faster Driving Methods.* The snug fit between the Phillips bit point and the tapered Phillips recess prevents the driver from slipping out of the recess, and permits change-over to electric and pneumatic driving, greatly decreasing the driving time over the slower hand-driving method.
2. *No Spoiled Work.* The non-slipping feature eliminates spoiled work and lost-time accidents. Every screw is driven up straight and tight.

These substantial savings in time and materials make American Phillips Screws the fastest method of war production screwdriving under any conditions. And when we return to peacetime production, these savings will lower the over-all cost of screw-driving assembly.

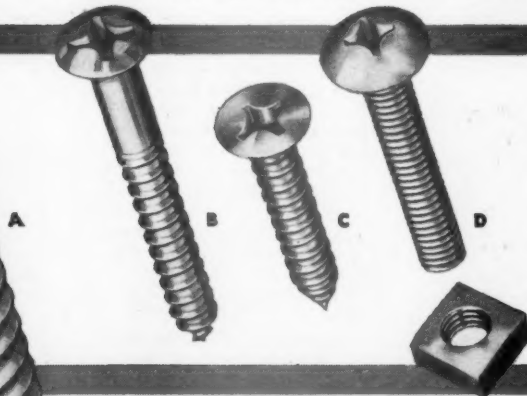
4-WINGED DRIVER CAN'T SLIP OUT
 OF PHILLIPS TAPERED RECESS

AMERICAN SCREW COMPANY

PROVIDENCE 1, RHODE ISLAND

Chicago 11: 589 E. Illinois Street Detroit 2: 502 Stephenson Building

American Screw Company manufactures a complete line of Phillips Recessed Head Screws, in a full range of sizes, and with all styles of heads.



A. American Phillips Machine Screws.

B. American Phillips Wood Screws.

C. American Phillips Hardened Self-Tapping Sheet Metal Screws.

D. American Phillips Stove Bolts.

Put the Screws on the Axis... BUY WAR BONDS!



THE
"OLD RELIABLE"
WRENCH

REMEMBER THE NAME — LOWELL

WHEN IN NEED OF REVERSIBLE RATCHET WRENCHES

The ultimate decision on the real worth of any tool made by the men who use it. They must test it on all types of jobs, large and small, before they can accept or reject it.

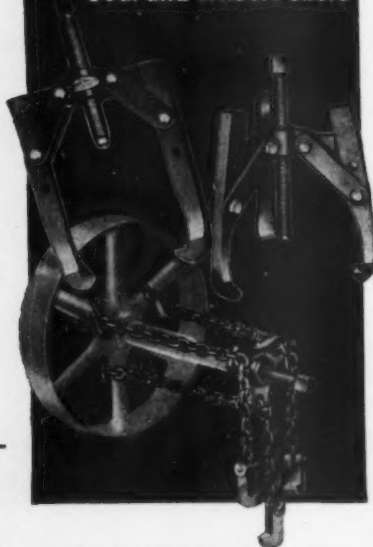
For 75 years Lowell Reversible Ratchet Wrenches have survived this test of actual performance. Their strength and efficiency are established.

Today War Jobs must come first but we are doing our best on all orders.

Remember, there is nothing just like LOWELL.

LOWELL WRENCH CO. WORCESTER, MASS.

ARMSTRONG-BRAY Gear and Wheel Pullers



PROMPT SHIPMENT FROM STOCK — ESSENTIAL TOOLS TODAY

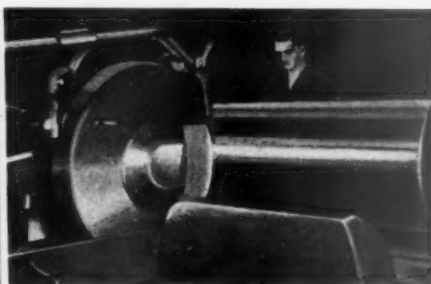
because they save hours of time, prevent costly breakage and long shut downs. STEELGRIP Standard Rigid Arm Gear and Wheel Pullers are of improved design. Will not slip from work. Arms are forged and heat-treated. 2-arm, 3-arm and special models. 12 types and sizes. CHAINGRIP Universal Pullers pull wheels, solid gears, pinions etc., even at considerable distance from end of shaft. Proof-tested chains have both chain hooks and special pulley hooks. 3-ton and 12-ton capacities.

Write for Catalog Sheets.

ARMSTRONG-BRAY & CO.

"The Belt Lacing People"

5378 Northwest Highway, Chicago 30, U. S. A.



PRECISION GRINDING

- High Production
- Required Finish
- Long Wheel Wear



If your precision grinding need is a wheel that will give you fast stock removal with better than required finish—and yet also give you a high production rate per wheel—then put down "DAYTON GRINDING WHEELS" for immediate trial.

You'll find Dayton Grinding Wheels have what it takes—are engineered to fit your job and to do that job precisely as the operation requires.

Wheels of many sizes, grains and grades are regularly carried in stock. Just write, wire, or phone us.

SIMONDS WORDEN WHITE CO.
708 Negley Place, Dayton, Ohio

Manufacturers of

DAYTON GRINDING WHEELS

Spending and Saving

(Continued from page 280)

for credit transfers, between buyers and sellers of such products should be presented for audit in the same manner as other claims, and the amount charged to the appropriate fund of the agency against which it is drawn, with credit to the fund of the institution making the sale.

Stock Control

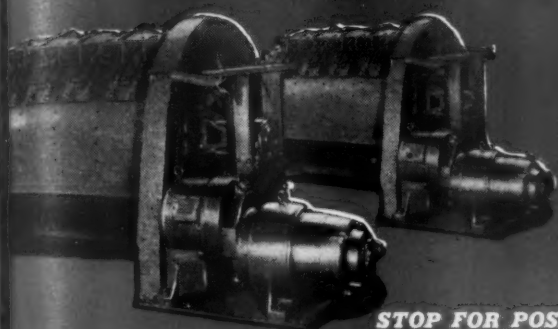
Any successful plan of centralized purchase must include stock control. Commodities received and stocked must be recorded, housed and cared for, whether they are home products, gifts, purchased items delivered directly to state agencies, or commodities placed in storage for redistribution. Hence, all state-owned property, however acquired, must be technically in the possession of the purchasing officer and entirely within his jurisdiction for allotment, transfer, use, or such other disposal as may be in the best interests of the state—always subject, of course, to the curbs provided against arbitrary use of authority.

State agents may not always consider the best interests of the taxpayers in the use of state property, particularly where it consists of home products. Perhaps a hospital with a herd of certified cattle may butcher the surplus young stock for food instead of giving it to another institution; and the latter, in turn, may buy certified young stock at prices far in excess of the market value of veal or beef. A somewhat similar situation may arise in the case of purchased commodities. An agent may overestimate his needs and accumulate an overstock of perishable supplies, but will not admit the mistake by sharing the surplus. As a result, there is waste and spoilage. To such state employees, public interests are negligible; paper profits are more important than monetary savings to the state treasury.

If such unfortunate conditions occasionally exist, they can be corrected by centralized fiscal control. The purchasing officer should be authorized to provide for transfer or exchange of commodities, whether under contract or on hand, of which one agency possesses a surplus and another is in need. Provision should also be made for repairing and reconditioning any articles available for transfer, with charges apportioned equitably between the parties to the transaction.

(Continued on page 284)

BUY UNITED STATES WAR BONDS AND STAMPS

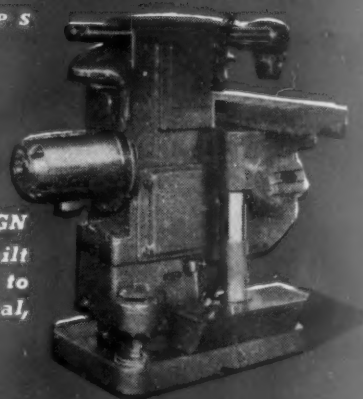


STOP FOR POSITION

Stop at the desired point for quickly and conveniently loading and unloading

SIMPLE COMPACT DESIGN

The electric brake is built into the motor end cover to form a compact, economical, easy to use unit.

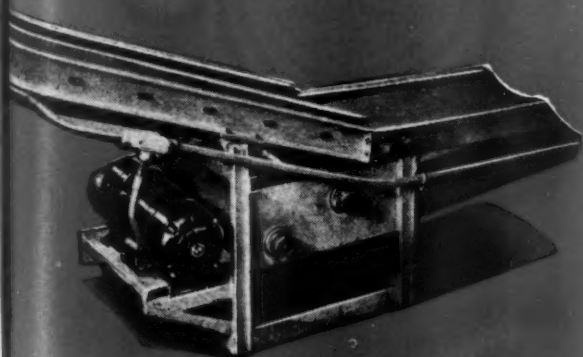


UNIBRAKE MOTORS

1/10 TO 100 HORSEPOWER



THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

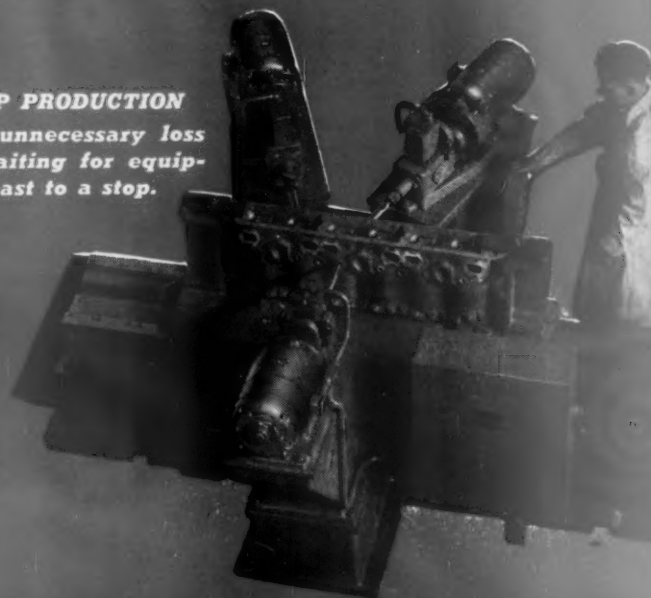


STOP AND HOLD ANY LOAD

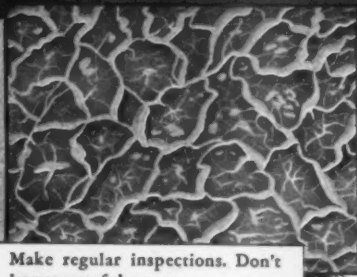
Unibrake motors are very advantageous on hoists, elevators, inclined conveyors, etc....

SPEED UP PRODUCTION

Eliminate unnecessary loss of time waiting for equipment to coast to a stop.



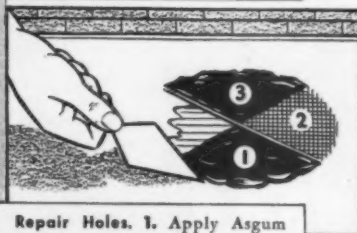
Your ROOFS WILL LAST LONGER IF...



Make regular inspections. Don't let your roof dry out.

YOU GIVE THEM REGULAR CARE WITH VALDURA ASGUM ROOF PROTECTION

Roof maintenance is easy and inexpensive with Valdura Asgum Liquid and Plastic. They keep roofs waterproof—prevent costly leaks and repairs.



Repair Holes. 1. Apply Asgum Liquid. 2. Patch. 3. Asgum Plastic.



Make flashings watertight—Just trowel on Asgum Plastic.

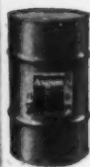


Seal Leaky Seams. 1. Nail down. 2. Apply Plastic. 3. Patch. 4. Asgum Liquid.



Waterproof every 3 or 4 years with Asgum Liquid.

No Skilled Labor Needed... JUST



Asgum Liquid—ready-to-use, no heat required—no mess—no bother.



A three-knot roofing brush or mop—anyone can apply it easily and quickly.



Use a simple trowel to apply the Plastic just as it comes from the container.



Valdura Asgum or Roofdura Plastic for permanently patching small holes and damaged spots.

WHEN YOU WANT TO KEEP FIRST COSTS DOWN and still get complete roof protection, use Roofdura—it contains no coal tar—will not melt, run or crack.

Free CHECK CHART. To help you make your roof and building maintenance inspection easier and thorough, Valdura offers a complete easy-to-use Check Chart. Write Dept. VA.



AMERICAN-MARIETTA COMPANY

Executive Offices

43 EAST OHIO STREET • CHICAGO 11, ILLINOIS

Spending and Saving

(Continued from page 282)

There must, of course, be accounting records to cover all such proceedings.

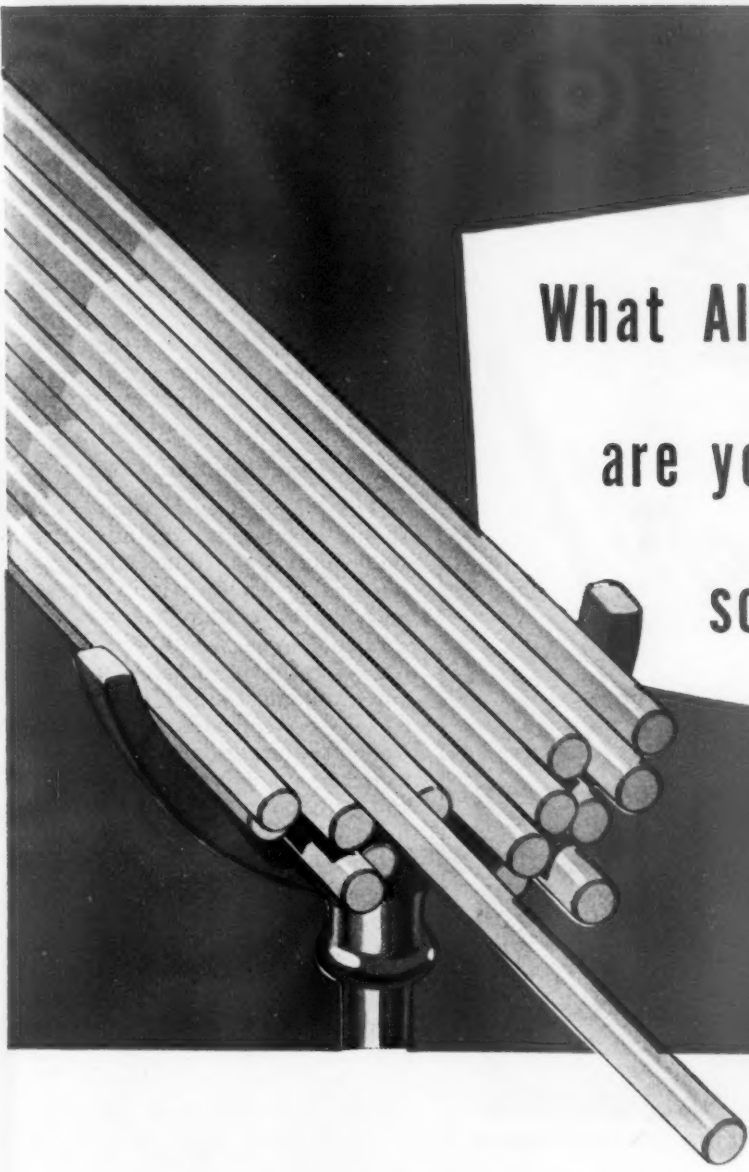
To implement this provision, the purchasing officer should (a) control, for purpose of allotment, transfer, or trade-in against the purchase of new equipment, all motorized, mechanical, scientific, technical, and electrical tools, equipment and apparatus; (b) determine the disposition of such units after inspection and appraisal; (c) sell, on competitive bids, either at public auction or private sale, all equipment which is surplus, obsolete, unused, or too costly in operation; or if such bids cannot be obtained, dispose of the property in the most advantageous manner; (d) destroy unusable and unsalable articles; (e) maintain a separate inventory of all items available for transfer, trade-in, loan or sale; and (f) maintain complete accounting records of all such transactions.

Central Stores

Aside from the desirability of controlling small orders through central receiving and distribution, the subject of general centralized storage and redistribution of commodities is controversial. The plan of maintaining central warehouses has definite possibilities as a measure for effective economies of purchase and control. The extent of geographic areas to be serviced, and the costs of operation and administration are offsetting factors. The practical answer, except within a limited territory, seems to be that the state should provide for direct shipment on all merchandise to be accepted at destination in full car or package quantities, and that warehousing should be confined to case and package goods that are to be split up and divided for reissue—and possibly should be further limited to supplies in common use where major economies can be effected.

If storehouses are to be maintained by the state, provision should be made for a revolving fund. Such a fund permits volume purchases of staple commodities. The amount of the fund should be fixed by specified appropriation in the state budget, within a maximum limit controlled through the purchase statute. As commodities are purchased, payment is made from this revolving fund, which is reimbursed as the

(Continued on page 286)



What Aluminum Alloy are you feeding your screw machines?

Alcoa Alloy 11-S, known as "free-cutting aluminum", was once the standard of many companies for their screw machine products. Then the necessities of war, and the need for maximum output of metal, made it necessary to limit the number of alloys produced. The high strength, but slower machining, 17-S was one of the alloys retained.

Today, production of aluminum has increased to a point where we are again in a position to offer Alloy 11-S. Here is a means, then, if the higher strength of 17-S is not required, of boosting the output of your screw machines: Change over to Alcoa Alloy 11-S.

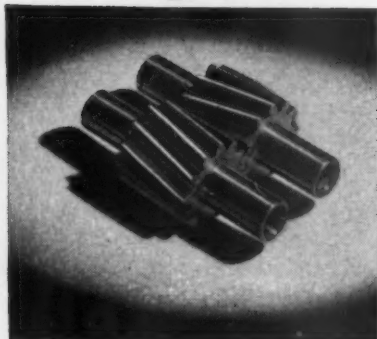
| TYPICAL MECHANICAL PROPERTIES | | | | |
|-------------------------------|----------------|-------------------|--------------------|-------------------|
| Alloy | Yield Strength | Ultimate Strength | Elongation % in 2" | Shearing Strength |
| 17-S | 40,000 | 62,000 | 22 | 36,000 |
| 11-S | 42,000 | 49,000 | 14 | 30,000 |

Using 11-S or 17-S—all of the usual advantages of aluminum are, of course, retained. You get three times as many pieces per pound, compared to the heavy metals. Resistance to corrosion is inherent in the metal. Aluminum requires no expensive plated coatings, but there are a number of Government-approved finishes for aluminum. For more complete data, write ALUMINUM COMPANY OF AMERICA, 1931 Gulf Building, Pittsburgh, Pennsylvania.

ALCOA ALUMINUM

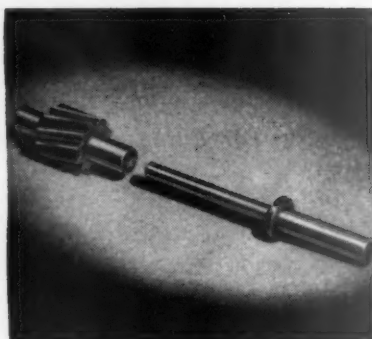
REG. U. S. P. M.

Why Roper Pumps Last Longer!



EQUAL SIZE PUMPING GEARS

The only moving parts in a Roper Pump are these two equal size pumping gears. They operate in a case with just enough clearance to prevent wear.



HYDRAULICALLY BALANCED

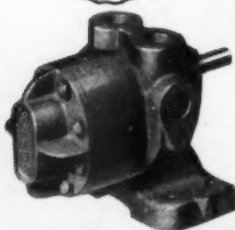
Entirely separate from drive shaft, the pumping gears actually "float in operation". Any thrust or shock is absorbed by sliding joint and thrust collar.

THE ROPER PRINCIPLE

When the Roper principle of two equal size pumping gears was introduced it proved to be the most economical and satisfactory way to transfer liquid. It was new then . . . it's new today because any device that handles a job in the best way the operation can be performed is never old. Roper simplicity of design reduces wear . . . lowers upkeep costs . . . lengthens service life.

Write for Catalog 437

ROPER
Rotary Pumps



GEO. D. ROPER CORP., ROCKFORD, ILL.

Spending and Saving

(Continued from page 284)

goods are distributed to their final destination.

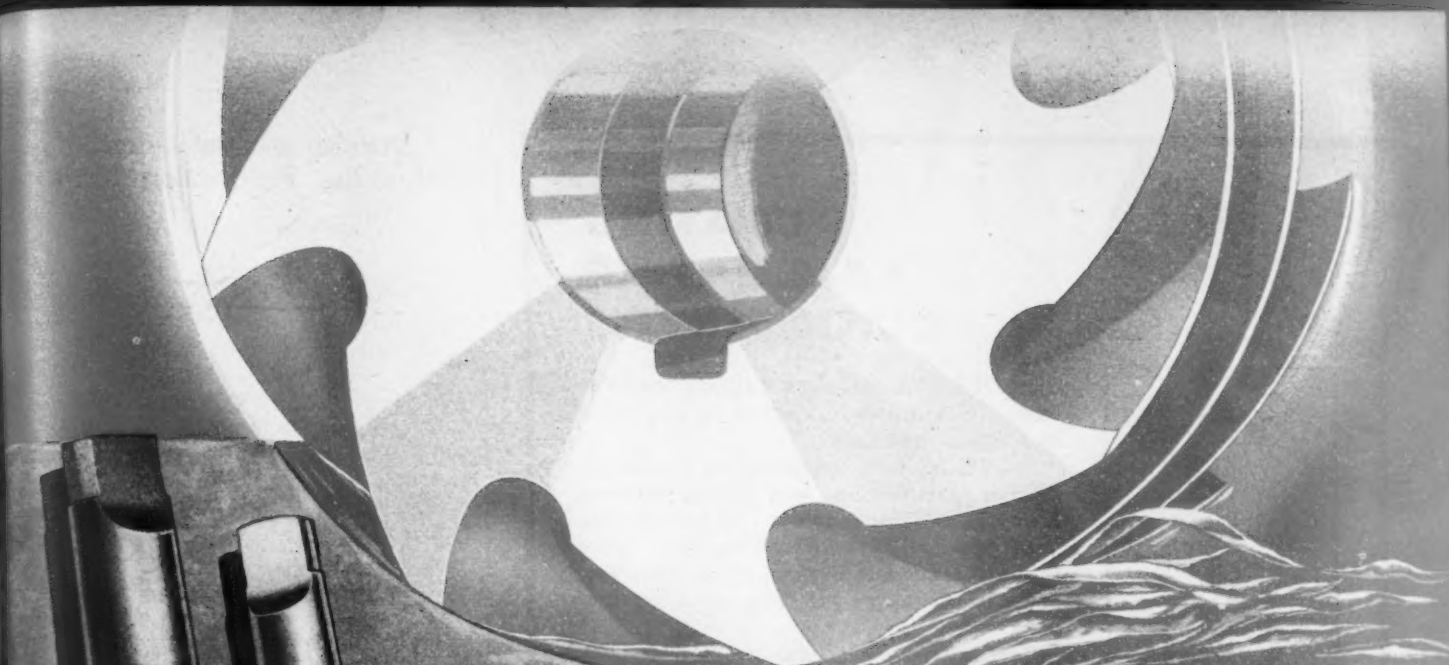
Unless the state carries its own insurance, the purchasing officer should be authorized to insure, in the name of the state, real and personal property, and any state-owned equipment or merchandise which may be stored in warehouses or depots not under exclusive state control. The premium could be paid out of available funds, or pro-rated and billed to the various agencies.

Counties and Cities

The state purchasing officer should cooperate and advise with the county, state and other public purchasing agents within the state, and should render to them every service commensurate with his facilities for the purpose. These local agents should receive, upon request, copies of specifications and purchase terms, information as to possible sources of supply, award schedules, and any other data of interest to them. Whether this service should extend beyond such information depends on policy, statutory authorization, and available personnel.

The statute should be explicit, both as to the responsibility of the purchasing officer and the terms of cooperation on the part of the local agents. Whether or not the local body is to be included in the state contracts should be decided in advance of awards. An optional clause binding the contractor but not the customer, is not advisable. If there is participation by the local units, purchases should be made only upon written requisitions approved in the state purchase division. Uniform procedure should be agreed upon. Any restrictions applying to state purchasing agents should also apply to local agents, including the responsibility for payment and the maintenance of good credit. The state and its agents should not be held in any way liable for the cost of purchases nor for the acts of the independent agents. Incidental expenses should be charged back to the localities enjoying the benefits of the contracts, and the state purchasing officer should have full authority to refuse service for any lack of cooperation.

In general, it would seem advisable to complete the centralization of purchasing for the state itself before undertaking more than advisory service for political subdivisions.



Searching For and Finding

THE RIGHT ANSWER TO METAL CUTTING PROBLEMS

SIXTY years' experience in solving difficult metal drilling, reaming, tapping, and cutting problems for customers has taught us to consider all possible answers rather than to depend on a single quality.

Given superb craftsmanship—which is a basic characteristic of all Standard Tools—the right answer to your tough job may lie in the formula, the heat treatment, design, testing, or any one of many factors.

To meet this situation, our products comprise thousands of items so that we may promptly select a standard drill, reamer, tap, or cutter that will meet not only all usual production problems but nearly any special condition that confronts you.

That's why we say—send us your tough jobs and we will let Red Shield Drills and Standard Reamers, Taps, and Cutters demonstrate their own merit.



"Red Shield" Brand
TWIST DRILLS
REAMERS
MILLING CUTTERS
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SPECIAL TOOLS

THE STANDARD TOOL Co.

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NEW YORK STORE
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COATING LAMINATING QUICK SERVICE



**ADHESIVE TAPES
COMBINING
CLOTHS BACKED
SKINS BACKED
BACKING CLOTHS
COATING
LAMINATING
RUBBERIZING**

ADHESIVE and chemical mix coatings expertly applied to paper, cloth, foils and other materials.

Fabrics backed, laminated or combined to your specifications, and special purpose formulas developed in our own Laboratory.

65 years of "Know-How" deliver "Use-Proved" tapes and backings deserving the enthusiastic approval they earn on the production lines.

Just tell us what your problem is and let our Laboratory, backed by their years of specialized experience in synthetics, help you find the perfect solution.

Let Mr. George L. Peters, E.M., Columbia 1911, head of our Engineering Staff, suggest from our formulas those experience indicates as best suited to your particular needs.

CHICAGO, ILL.
H. Rabin, 30 No. LaSalle St.
LOS ANGELES, CAL.
A. B. Boyd Co., 743 E. 14th St.
PETERSBURG, VA.
Wm. A. Bragg, 224 No. Sycamore St.
PORTLAND, ORE.
A. B. Boyd Co., S. E. Union & Morrison
SAN FRANCISCO, CAL.
A. B. Boyd Co., 1235 Howard St.
SEATTLE, WASH.
A. B. Boyd Co., 404 Dexter Ave.
ST. LOUIS, MO.
C. E. Wilkins, 1402 Locust St.
WALLASTON, MASS.
S. B. Scott, 123 Elm St.
CAPE TOWN, S. A.
K. Stein Agency Co., 12 Plain St.

Peters Bros.

RUBBER COMPANY, INC.

150 150 JOHN ST., Brooklyn, N.Y.

ESTABLISHED 3 GENERATIONS

Purchase Cost Data Helps the Production Man

(Continued from page 89)

Reversible Type Plug: A number of firms make a non-AGD plug gage consisting of a collet type handle which locks both Go and No Go members. The members themselves, either steel or chrome, are reversible when worn. Maximum size is one inch diameter. The cost in steel of $\frac{1}{2}$ " size is \$10.15; $\frac{1}{2}$ " size \$10.50.

Thread Plug Gages

Relative Value: (See Table II). Unlike the case of the cylindrical plug gages, no general statement can be made on the wearing qualities. Carbide is brittle and the crest of a thread may be cracked off if it is given ordinary steel plug care. Chrome plating will chip and flake more easily on a thread form than it does on an even surface. However steel is not the only metal for thread gages and some of our Plants have used, with much success, chrome and carbide gages.

Gage Blocks

Our standards for some years have been the "Hoke" set made by P&W and the "Johansson" set made by Swedish Gage. The 81 piece Inspection Sets cost \$425.00 and \$350.00, respectively.

A few of our Plants have chrome plated gage blocks made by the Dearborn Gage Company costing \$525.00 for the 81 piece Inspection Set. Dearborn claims up to "twenty times longer life than hard steel gage blocks" and while we may agree to only half that figure, it still indicates an excellent buy. \$500.00 worth of chrome blocks would give wear equal to \$4,000.00 worth of hard steel blocks.

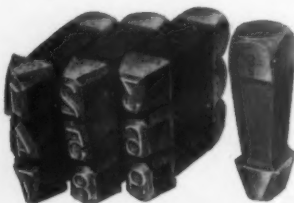
Lincoln Park Tool & Gage has recently brought out gage blocks of tungsten carbide. They are to be used to reduce the wear caused by abrasion on the ends of the build-up. A set of two .050" or two .100" (accuracy of .000004") costs \$50.-00. A set of 14 blocks costs \$350.00.

Snap Gages

Adjustable Snap Gages: (See Table III). Steel replacement anvils cost \$1.50 each; buttons 75¢ each; chrome plated anvils for replacement cost \$2.70 each; spherical chrome buttons \$1.45 each.

SAFETY (Reg. Trade Mark) WEDGE GRIP LETTERS & FIGURES

- No Spalling!
- No Mushrooming!



Pat. No. 2,089,794

- For tough stamping jobs
- Deeper impression with less exertion
- Any size character from 1/16" to 1"
- 25% to 50% more service

WRITE FOR LITERATURE



BUYER FARM SUPPLIES

Ohio company, with established distribution through its hundreds of company operated stores and thousands of independent dealers, has a position for an experienced buyer of farm supplies and light farm equipment. This offer presents an excellent post-war opportunity for qualified applicant. Must be capable merchandiser, know source of supply and be able to expedite items purchased. Prefer chain or mail order background. In reply give in detail, experience, as well as age and salary demand.

Write

Box #955, PURCHASING,
205 East 42nd St., New York,
N. Y.

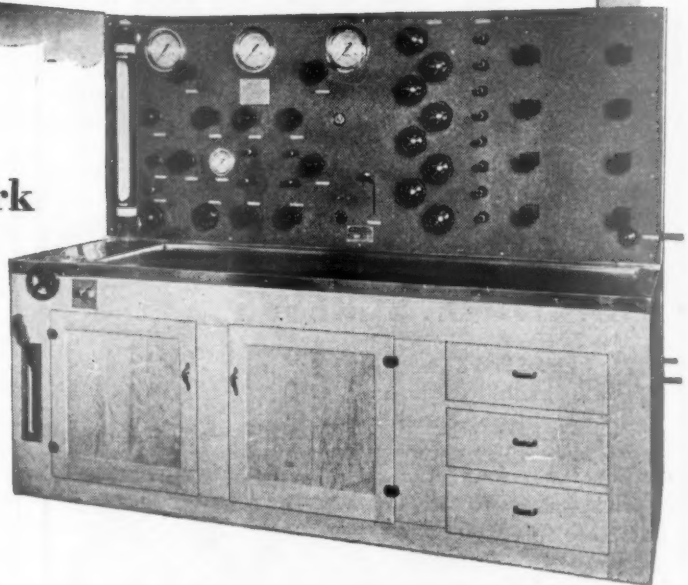
MY FOOLISH FRIEND



FREE ENLARGEMENTS (14" wide) of this cartoon by Edmund Duffy, three-times winner of the Pulitzer Prize, are available. Write, on your business letterhead, to: Bruce Livie, President, Liberty Motors & Engineering Corp., Baltimore-1, Md.

Special Skills and Equipment for High-Precision Machine Work Electrical Assembly Work

AS a manufacturer, Liberty makes highly accurate testing equipment and service tools for aircraft, of which the Hydraulic Test Bench at the right is just one example. These Liberty products are used by armed forces and governments of the United Nations, as well as by airlines and aircraft plants. In addition, as a subcontractor, Liberty produces quantities of high-precision machined parts and electrical assemblies for other manufacturers. Maybe Liberty's special skills and equipment can help you. We'll be glad to tell you more about them, upon request.



**LIBERTY MOTORS
& ENGINEERING CORPORATION**
BALTIMORE-1, MARYLAND

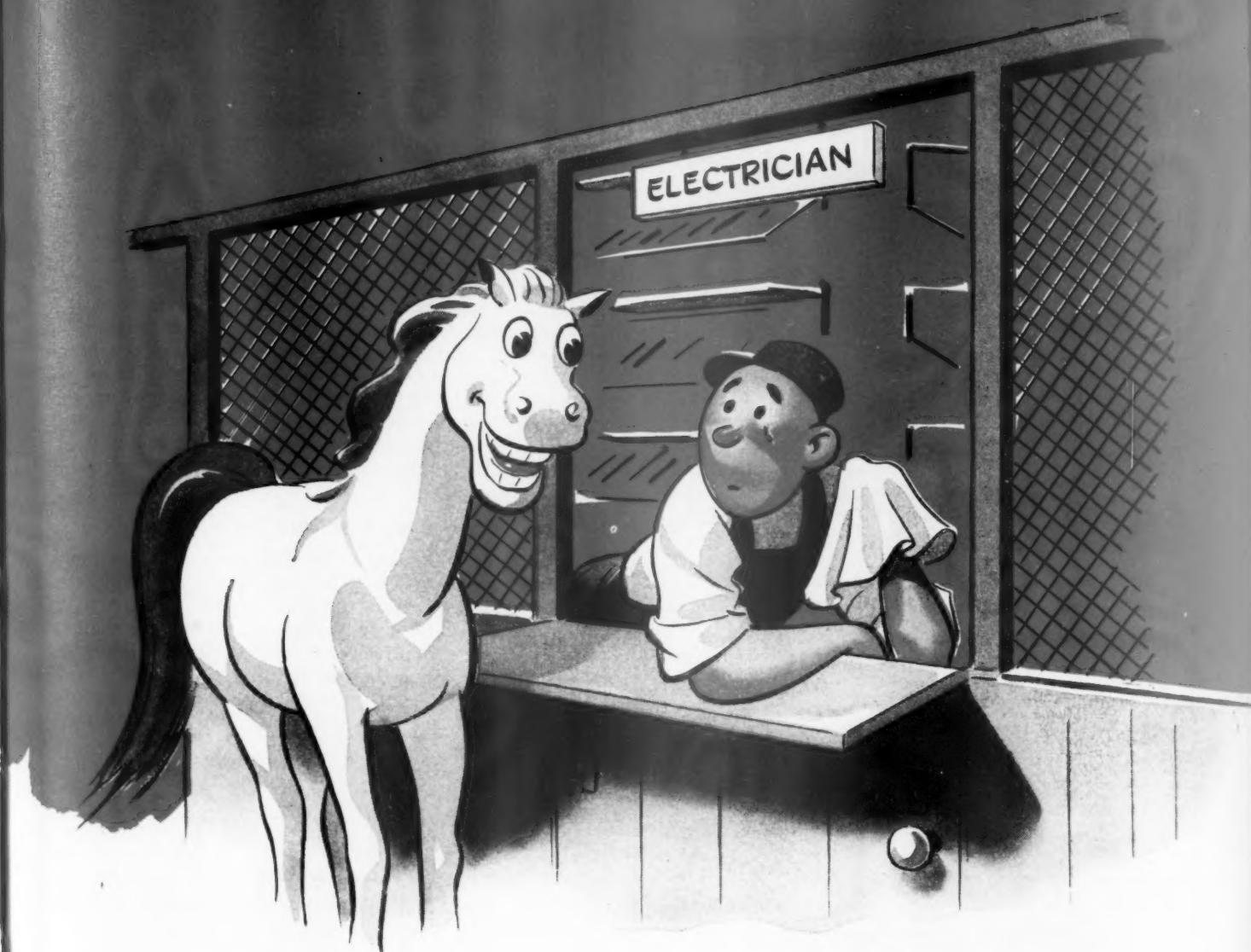
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MANUFACTURERS OF AIRCRAFT SERVICE TOOLS AND TEST EQUIPMENT

Specify **STRONGHOLD** SCREW PRODUCTS

TROUBLE FREE FASTENINGS

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1/8" | 1/4" | 3/8" | 1/2" | 5/8" | 3/4" | 1" | 1 1/4" | 1 1/2" | 1 3/4" | 2" | 2 1/4" | 2 1/2" | 2 3/4" | 3" | 3 1/4" | 3 1/2" | 3 3/4" | 4" | 4 1/4" | 4 1/2" | 4 3/4" | 5" | 5 1/4" | 5 1/2" | 5 3/4" | 6" | 6 1/4" | 6 1/2" | 6 3/4" | 7" | 7 1/4" | 7 1/2" | 7 3/4" | 8" | 8 1/4" | 8 1/2" | 8 3/4" | 9" | 9 1/4" | 9 1/2" | 9 3/4" | 10" | 10 1/4" | 10 1/2" | 10 3/4" | 11" | 11 1/4" | 11 1/2" | 11 3/4" | 12" | 12 1/4" | 12 1/2" | 12 3/4" | 13" | 13 1/4" | 13 1/2" | 13 3/4" | 14" | 14 1/4" | 14 1/2" | 14 3/4" | 15" | 15 1/4" | 15 1/2" | 15 3/4" | 16" | 16 1/4" | 16 1/2" | 16 3/4" | 17" | 17 1/4" | 17 1/2" | 17 3/4" | 18" | 18 1/4" | 18 1/2" | 18 3/4" | 19" | 19 1/4" | 19 1/2" | 19 3/4" | 20" | 20 1/4" | 20 1/2" | 20 3/4" | 21" | 21 1/4" | 21 1/2" | 21 3/4" | 22" | 22 1/4" | 22 1/2" | 22 3/4" | 23" | 23 1/4" | 23 1/2" | 23 3/4" | 24" | 24 1/4" | 24 1/2" | 24 3/4" | 25" | 25 1/4" | 25 1/2" | 25 3/4" | 26" | 26 1/4" | 26 1/2" | 26 3/4" | 27" | 27 1/4" | 27 1/2" | 27 3/4" | 28" | 28 1/4" | 28 1/2" | 28 3/4" | 29" | 29 1/4" | 29 1/2" | 29 3/4" | 30" | 30 1/4" | 30 1/2" | 30 3/4" | 31" | 31 1/4" | 31 1/2" | 31 3/4" | 32" | 32 1/4" | 32 1/2" | 32 3/4" | 33" | 33 1/4" | 33 1/2" | 33 3/4" | 34" | 34 1/4" | 34 1/2" | 34 3/4" | 35" | 35 1/4" | 35 1/2" | 35 3/4" | 36" | 36 1/4" | 36 1/2" | 36 3/4" | 37" | 37 1/4" | 37 1/2" | 37 3/4" | 38" | 38 1/4" | 38 1/2" | 38 3/4" | 39" | 39 1/4" | 39 1/2" | 39 3/4" | 40" | 40 1/4" | 40 1/2" | 40 3/4" | 41" | 41 1/4" | 41 1/2" | 41 3/4" | 42" | 42 1/4" | 42 1/2" | 42 3/4" | 43" | 43 1/4" | 43 1/2" | 43 3/4" | 44" | 44 1/4" | 44 1/2" | 44 3/4" | 45" | 45 1/4" | 45 1/2" | 45 3/4" | 46" | 46 1/4" | 46 1/2" | 46 3/4" | 47" | 47 1/4" | 47 1/2" | 47 3/4" | 48" | 48 1/4" | 48 1/2" | 48 3/4" | 49" | 49 1/4" | 49 1/2" | 49 3/4" | 50" | 50 1/4" | 50 1/2" | 50 3/4" | 51" | 51 1/4" | 51 1/2" | 51 3/4" | 52" | 52 1/4" | 52 1/2" | 52 3/4" | 53" | 53 1/4" | 53 1/2" | 53 3/4" | 54" | 54 1/4" | 54 1/2" | 54 3/4" | 55" | 55 1/4" | 55 1/2" | 55 3/4" | 56" | 56 1/4" | 56 1/2" | 56 3/4" | 57" | 57 1/4" | 57 1/2" | 57 3/4" | 58" | 58 1/4" | 58 1/2" | 58 3/4" | 59" | 59 1/4" | 59 1/2" | 59 3/4" | 60" | 60 1/4" | 60 1/2" | 60 3/4" | 61" | 61 1/4" | 61 1/2" | 61 3/4" | 62" | 62 1/4" | 62 1/2" | 62 3/4" | 63" | 63 1/4" | 63 1/2" | 63 3/4" | 64" | 64 1/4" | 64 1/2" | 64 3/4" | 65" | 65 1/4" | 65 1/2" | 65 3/4" | 66" | 66 1/4" | 66 1/2" | 66 3/4" | 67" | 67 1/4" | 67 1/2" | 67 3/4" | 68" | 68 1/4" | 68 1/2" | 68 3/4" | 69" | 69 1/4" | 69 1/2" | 69 3/4" | 70" | 70 1/4" | 70 1/2" | 70 3/4" | 71" | 71 1/4" | 71 1/2" | 71 3/4" | 72" | 72 1/4" | 72 1/2" | 72 3/4" | 73" | 73 1/4" | 73 1/2" | 73 3/4" | 74" | 74 1/4" | 74 1/2" | 74 3/4" | 75" | 75 1/4" | 75 1/2" | 75 3/4" | 76" | 76 1/4" | 76 1/2" | 76 3/4" | 77" | 77 1/4" | 77 1/2" | 77 3/4" | 78" | 78 1/4" | 78 1/2" | 78 3/4" | 79" | 79 1/4" | 79 1/2" | 79 3/4" | 80" | 80 1/4" | 80 1/2" | 80 3/4" | 81" | 81 1/4" | 81 1/2" | 81 3/4" | 82" | 82 1/4" | 82 1/2" | 82 3/4" | 83" | 83 1/4" | 83 1/2" | 83 3/4" | 84" | 84 1/4" | 84 1/2" | 84 3/4" | 85" | 85 1/4" | 85 1/2" | 85 3/4" | 86" | 86 1/4" | 86 1/2" | 86 3/4" | 87" | 87 1/4" | 87 1/2" | 87 3/4" | 88" | 88 1/4" | 88 1/2" | 88 3/4" | 89" | 89 1/4" | 89 1/2" | 89 3/4" | 90" | 90 1/4" | 90 1/2" | 90 3/4" | 91" | 91 1/4" | 91 1/2" | 91 3/4" | 92" | 92 1/4" | 92 1/2" | 92 3/4" | 93" | 93 1/4" | 93 1/2" | 93 3/4" | 94" | 94 1/4" | 94 1/2" | 94 3/4" | 95" | 95 1/4" | 95 1/2" | 95 3/4" | 96" | 96 1/4" | 96 1/2" | 96 3/4" | 97" | 97 1/4" | 97 1/2" | 97 3/4" | 98" | 98 1/4" | 98 1/2" | 98 3/4" | 99" | 99 1/4" | 99 1/2" | 99 3/4" | 100" | 100 1/4" | 100 1/2" | 100 3/4" | 101" | 101 1/4" | 101 1/2" | 101 3/4" | 102" | 102 1/4" | 102 1/2" | 102 3/4" | 103" | 103 1/4" | 103 1/2" | 103 3/4" | 104" | 104 1/4" | 104 1/2" | 104 3/4" | 105" | 105 1/4" | 105 1/2" | 105 3/4" | 106" | 106 1/4" | 106 1/2" | 106 3/4" | 107" | 107 1/4" | 107 1/2" | 107 3/4" | 108" | 108 1/4" | 108 1/2" | 108 3/4" | 109" | 109 1/4" | 109 1/2" | 109 3/4" | 110" | 110 1/4" | 110 1/2" | 110 3/4" | 111" | 111 1/4" | 111 1/2" | 111 3/4" | 112" | 112 1/4" | 112 1/2" | 112 3/4" | 113" | 113 1/4" | 113 1/2" | 113 3/4" | 114" | 114 1/4" | 114 1/2" | 114 3/4" | 115" | 115 1/4" | 115 1/2" | 115 3/4" | 116" | 116 1/4" | 116 1/2" | 116 3/4" | 117" | 117 1/4" | 117 1/2" | 117 3/4" | 118" | 118 1/4" | 118 1/2" | 118 3/4" | 119" | 119 1/4" | 119 1/2" | 119 3/4" | 120" | 120 1/4" | 120 1/2" | 120 3/4" | 121" | 121 1/4" | 121 1/2" | 121 3/4" | 122" | 122 1/4" | 122 1/2" | 122 3/4" | 123" | 123 1/4" | 123 1/2" | 123 3/4" | 124" | 124 1/4" | 124 1/2" | 124 3/4" | 125" | 125 1/4" | 125 1/2" | 125 3/4" | 126" | 126 1/4" | 126 1/2" | 126 3/4" | 127" | 127 1/4" | 127 1/2" | 127 3/4" | 128" | 128 1/4" | 128 1/2" | 128 3/4" | 129" | 129 1/4" | 129 1/2" | 129 3/4" | 130" | 130 1/4" | 130 1/2" | 130 3/4" | 131" | 131 1/4" | 131 1/2" | 131 3/4" | 132" | 132 1/4" | 132 1/2" | 132 3/4" | 133" | 133 1/4" | 133 1/2" | 133 3/4" | 134" | 134 1/4" | 134 1/2" | 134 3/4" | 135" | 135 1/4" | 135 1/2" | 135 3/4" | 136" | 136 1/4" | 136 1/2" | 136 3/4" | 137" | 137 1/4" | 137 1/2" | 137 3/4" | 138" | 138 1/4" | 138 1/2" | 138 3/4" | 139" | 139 1/4" | 139 1/2" | 139 3/4" | 140" | 140 1/4" | 140 1/2" | 140 3/4" | 141" | 141 1/4" | 141 1/2" | 141 3/4" | 142" | 142 1/4" | 142 1/2" | 142 3/4" | 143" | 143 1/4" | 143 1/2" | 143 3/4" | 144" | 144 1/4" | 144 1/2" | 144 3/4" | 145" | 145 1/4" | 145 1/2" | 145 3/4" | 146" | 146 1/4" | 146 1/2" | 146 3/4" | 147" | 147 1/4" | 147 1/2" | 147 3/4" | 148" | 148 1/4" | 148 1/2" | 148 3/4" | 149" | 149 1/4" | 149 1/2" | 149 3/4" | 150" | 150 1/4" | 150 1/2" | 150 3/4" | 151" | 151 1/4" | 151 1/2" | 151 3/4" | 152" | 152 1/4" | 152 1/2" | 152 3/4" | 153" | 153 1/4" | 153 1/2" | 153 3/4" | 154" | 154 1/4" | 154 1/2" | 154 3/4" | 155" | 155 1/4" | 155 1/2" | 155 3/4" | 156" | 156 1/4" | 156 1/2" | 156 3/4" | 157" | 157 1/4" | 157 1/2" | 157 3/4" | 158" | 158 1/4" | 158 1/2" | 158 3/4" | 159" | 159 1/4" | 159 1/2" | 159 3/4" | 160" | 160 1/4" | 160 1/2" | 160 3/4" | 161" | 161 1/4" | 161 1/2" | 161 3/4" | 162" | 162 1/4" | 162 1/2" | 162 3/4" | 163" | 163 1/4" | 163 1/2" | 163 3/4" | 164" | 164 1/4" | 164 1/2" | 164 3/4" | 165" | 165 1/4" | 165 1/2" | 165 3/4" | 166" | 166 1/4" | 166 1/2" | 166 3/4" | 167" | 167 1/4" | 167 1/2" | 167 3/4" | 168" | 168 1/4" | 168 1/2" | 168 3/4" | 169" | 169 1/4" | 169 1/2" | 169 3/4" | 170" | 170 1/4" | 170 1/2" | 170 3/4" | 171" | 171 1/4" | 171 1/2" | 171 3/4" | 172" | 172 1/4" | 172 1/2" | 172 3/4" | 173" | 173 1/4" | 173 1/2" | 173 3/4" | 174" | 174 1/4" | 174 1/2" | 174 3/4" | 175" | 175 1/4" | 175 1/2" | 175 3/4" | 176" | 176 1/4" | 176 1/2" | 176 3/4" | 177" | 177 1/4" | 177 1/2" | 177 3/4" | 178" | 178 1/4" | 178 1/2" | 178 3/4" | 179" | 179 1/4" | 179 1/2" | 179 3/4" | 180" | 180 1/4" | 180 1/2" | 180 3/4" | 181" | 181 1/4" | 181 1/2" | 181 3/4" | 182" | 182 1/4" | 182 1/2" | 182 3/4" | 183" | 183 1/4" | 183 1/2" | 183 3/4" | 184" | 184 1/4" | 184 1/2" | 184 3/4" | 185" | 185 1/4" | 185 1/2" | 185 3/4" | 186" | 186 1/4" | 186 1/2" | 186 3/4" | 187" | 187 1/4" | 187 1/2" | 187 3/4" | 188" | 188 1/4" | 188 1/2" | 188 3/4" | 189" | 189 1/4" | 189 1/2" | 189 3/4" | 190" | 190 1/4" | 190 1/2" | 190 3/4" | 191" | 191 1/4" | 191 1/2" | 191 3/4" | 192" | 192 1/4" | 192 1/2" | 192 3/4" | 193" | 193 1/4" | 193 1/2" | 193 3/4" | 194" | 194 1/4" | 194 1/2" | 194 3/4" | 195" | 195 1/4" | 195 1/2" | 195 3/4" | 196" | 196 1/4" | 196 1/2" | 196 3/4" | 197" | 197 1/4" | 197 1/2" | 197 3/4" | 198" | 198 1/4" | 198 1/2" | 198 3/4" | 199" | 199 1/4" | 199 1/2" | 199 3/4" | 200" | 200 1/4" | 200 1/2" | 200 3/4" | 201" | 201 1/4" | 201 1/2" | 201 3/4" | 202" | 202 1/4" | 202 1/2" | 202 3/4" | 203" | 203 1/4" | 203 1/2" | 203 3/4" | 204" | 204 1/4" | 204 1/2" | 204 3/4" | 205" | 205 1/4" | 205 1/2" | 205 3/4" | 206" | 206 1/4" | 206 1/2" | 206 3/4" | 207" | 207 1/4" | 207 1/2" | 207 3/4" | 208" | 208 1/4" | 208 1/2" | 208 3/4" | 209" | 209 1/4" | 209 1/2" | 209 3/4" | 210" | 210 1/4" | 210 1/2" | 210 3/4" | 211" | 211 1/4" | 211 1/2" | 211 3/4" | 212" | 212 1/4" | 212 1/2" | 212 3/4" | 213" | 213 1/4" | 213 1/2" | 213 3/4" | 214" | 214 1/4" | 214 1/2" | 214 3/4" | 215" | 215 1/4" | 215 1/2" | 215 3/4" | 216" | 216 1/4" | 216 1/2" | 216 3/4" | 217" | 217 1/4" | 217 1/2" | 217 3/4" | 218" | 218 1/4" | 218 1/2" | 218 3/4" | 219" | 219 1/4" | 219 1/2" | 219 3/4" | 220" | 220 1/4" | 220 1/2" | 220 3/4" | 221" | 221 1/4" | 221 1/2" | 221 3/4" | 222" | 222 1/4" | 222 1/2" | 222 3/4" | 223" | 223 1/4" | 223 1/2" | 223 3/4" | 224" | 224 1/4" | 224 1/2" | 224 3/4" | 225" | 225 1/4" | 225 1/2" | 225 3/4" | 226" | 226 1/4" | 226 1/2" | 226 3/4" | 227" | 227 1/4" | 227 1/2" | 227 3/4" | 228" | 228 1/4" | 228 1/2" | 228 3/4" | 229" | 229 1/4" | 229 1/2" | 229 3/4" | 230" | 230 1/4" | 230 1/2" | 230 3/4" | 231" | 231 1/4" | 231 1/2" | 231 3/4" | 232" | 232 1/4" | 232 1/2" | 232 3/4" | 233" | 233 1/4" | 233 1/2" | 233 3/4" | 234" | 234 1/4" | 234 1/2" | 234 3/4" | 235" | 235 1/4" | 235 1/2" | 235 3/4" | 236" | 236 1/4" | 236 1/2" | 236 3/4" | 237" | 237 1/4" | 237 1/2" | 237 3/4" | 238" | 238 1/4" | 238 1/2" | 238 3/4" | 239" | 239 1/4" | 239 1/2" | 239 3/4" | 240" | 240 1/4" | 240 1/2" | 240 3/4" | 241" | 241 1/4" | 241 1/2" | 241 3/4" | 242" | 242 1/4" | 242 1/2" | 242 3/4" | 243" | 243 1/4" | 243 1/2" | 243 3/4" | 244" | 244 1/4" | 244 1/2" | 244 3/4" | 245" | 245 1/4" | 245 1/2" | 245 3/4" | 246" | 246 1/4" | 246 1/2" | 246 3/4" | 247" | 247 1/4" | 247 1/2" | 247 3/4" | 248" | 248 1/4" | 248 1/2" | 248 3/4" | 249" | 249 1/4" | 249 1/2" | 249 3/4" | 250" | 250 1/4" | 250 1/2" | 250 3/4" | 251" | 251 1/4" | 251 1/2" | 251 3/4" | 252" | 252 1/4" | 252 1/2" | 252 3/4" | 253" | 253 1/4" | 253 1/2" | 253 3/4" | 254" | 254 1/4" | 254 1/2" | 254 3/4" | 255" | 255 1/4" | 255 1/2" | 255 3/4" | 256" | 256 1/4" | 256 1/2" | 256 3/4" | 257" | 257 1/4" | 257 1/2" | 257 3/4" | 258" | 258 1/4" | 258 1/2" | 258 3/4" | 259" | 259 1/4" | 259 1/2" | 259 3/4" | 260" | 260 1/4" | 260 1/2" | 260 3/4" | 261" | 261 1/4" | 261 1/2" | 261 3/4" | 262" | 262 1/4" | 262 1/2" | 262 3/4" | 263" | 263 1/4" | 263 1/2" | 263 3/4" | 264" | 264 1/4" | 264 1/2" | 264 3/4" | 265" | 265 1/4" | 265 1/2" | 265 3/4" | 266" | 266 1/4" | 266 1/2" | 266 3/4" | 267" | 267 1/4" | 267 1/2" | 267 3/4" | 268" | 268 1/4" | 268 1/2" | 268 3/4" | 269" | 269 1/4" | 269 1/2" | 269 3/4" | 270" | 270 1/4" | 270 1/2" | 270 3/4" | 271" | 271 1/4" | 271 1/2" | 271 3/4" | 272" | 272 1/4" | 272 1/2" | 272 3/4" | 273" | 273 1/4" | 273 1/2" | 273 3/4" | 274" | 274 1/4" | 274 1/2" | 274 3/4" | 275" | 275 1/4" | 275 1/2" | 275 3/4" | 276" | 276 1/4" | 276 1/2" | 276 3/4" | 277" | 277 1/4" | 277 1/2" | 277 3/4" | 278" | 278 1/4" | 278 1/2" | 278 3/4" | 279" | 279 1/4" | 279 1/2" | 279 3/4" | 280" | 280 1/4" | 280 1/2" | 280 3/4" | 281" | 281 1/4" | 281 1/2" | 281 3/4" | 282" | 282 1/4" | 282 1/2" | 282 3/4" | 283" | 283 1/4" | 283 1/2" | 283 3/4" | 284" | 284 1/4" | 284 1/2" | 284 3/4" | 285" | 285 1/4" | 285 1/2" | 285 3/4" | 286" | 286 1/4" | 286 1/2" | 286 3/4" | 287" | 287 1/4" | 287 1/2" | 287 3/4"</ |
|------|------|------|------|------|------|----|--------|--------|--------|----|--------|--------|--------|----|--------|--------|--------|----|--------|--------|--------|----|--------|--------|--------|----|--------|--------|--------|----|--------|--------|--------|----|--------|--------|--------|----|--------|--------|--------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|-----|---------|---------|---------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|----------|------|----------|----------|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"Beefing" Won't Help! You need Horsepower by Howell

ELECTRICIAN: Boy, they're running me ragged. Motors coming in with no insulating varnish on 'em, and no phase insulation. Some of 'em out of balance. Doesn't take much to break those babies down.

HORSE: I know. That's why I want to tell you about Howell Motors.

ELECTRICIAN: Yeah! You better know what you're talkin' about.

HORSE: Every Howell Motor is precision-built and thoroughly insulated. All our rotors are statically and dynamically balanced, too.

ELECTRICIAN: Good! But do they stay that way?

HORSE: You bet they do! Good materials—copper rotors, high grade bronze or ball bearings—and careful workmanship insure long life. Ask the hundreds of Howell users in the automobile, ventilation and air conditioning industries, in dairies, grain elevators, shipyards, tank plants—they'll tell you . . . you can always depend on Howell Motors for longer, more dependable operation.

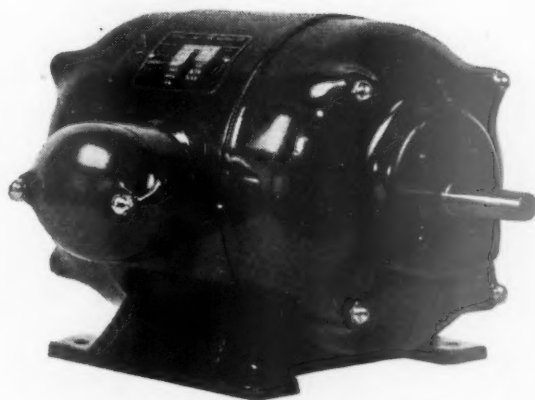
ELECTRICIAN: I know. I've used them. But we haven't got Howells here.

HORSE: Well, quit "beefing" and specify Horsepower by Howell for your next job.

For your specialized or standard motors, phone the nearest Howell representative today, or write the factory. Get the finest motors that money can buy at no premium in price.

HOWELL ELECTRIC MOTORS COMPANY
HOWELL, MICHIGAN

Manufacturers of Quality Motors Since 1915

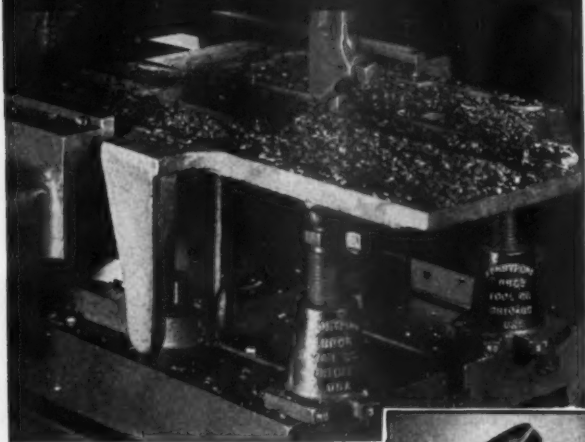


The Howell Protected Type Motor, shown, gives complete protection against dripping liquids, metal chips and other falling particles. Completely streamlined—utilizing non-breakable steel frame—malleable or steel base—cast iron end plates and cast iron, weatherproof terminal box are standard construction features. Special horizontal and vertical mountings are available.

Available in sizes 5 H.P. and smaller.

ARMSTRONG

DROP FORGED SETTING-UP TOOLS



Make up for shortages with ARMSTRONG TOOL HOLDERS

Production schedules can often be held up in the face of a labor shortage by stepping up speeds and feeds on lathes, planers, slotters and shapers. With the correct ARMSTRONG TOOL HOLDERS for each operation, it is not only possible but practical to operate these machine tools at speeds and feeds far above those accepted as "standard." ARMSTRONG TOOL HOLDERS will not only stand up to but will cut efficiently and safely at speeds ordinarily attained only on automatic production tools. If hampered by a shortage of labor or machine tools, your first logical move is to step-up all operations employing ARMSTRONG TOOL HOLDERS.

Equal to the shortage of men and machine tools is the shortage of high-speed-steel. Here again the use of more ARMSTRONG TOOL HOLDERS is logical because ARMSTRONG TOOL HOLDERS save 90% high speed steel—make each ounce of high speed steel do the work of 10 ounces in forged tools.

Especially now, with skilled labor scarce and double production schedules to meet there's no time to pick over the scrap pile searching for make-shift setting-up tools.

Cut setting-up time to a fraction and prevent accidents and spoilage by providing each machine tool with a complete set of ARMSTRONG Setting-up Tools including: Drop Forged Strap Clamps (6 types), Planer and Bracing Jacks — each in many sizes.

Write for Catalog C-39a.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"

303 N. Francisco Ave., Chicago 12, U.S.A.

Eastern Warehouse and Sales
199 LAFAYETTE ST., NEW YORK



ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
303 N. FRANCISCO AVE. CHICAGO, U.S.A.
Eastern Warehouse & Sales: 199 Lafayette St., New York



(Continued from page 290)

will determine the degree of hazard of a given occupancy. Further information is contained in a pamphlet entitled "First Aid Fire Appliances," published by the National Board of Fire Underwriters, 85 John Street, New York, New York.

Periodic Demonstrations

The speed with which an employee uses an extinguisher to attack an incipient fire often makes the difference between an incident and a disaster. Therefore fire protection authorities recommend that periodic fire extinguisher demonstrations be held to teach plant personnel the simple but important rules for operating extinguishers. If demonstrations are too difficult to arrange, this information can be conveyed by means of wall posters, articles in company papers or oral instructions by foremen. Below are step-by-step directions for operating the different kinds of approved hand extinguishers:

Soda-Acid and Foam

Soda-acid and foam extinguishers are usually hung on wall hangers or set on brackets or shelves. Take the hose between the thumb and index finger of the right hand and grasp the ring-top handle. Then with the left hand and lift the extinguisher off the hook and lower it, keeping the extinguisher in an upright position. Carry the extinguisher to the fire by means of the ring top handle held in the right hand, still maintaining a hold on the hose nozzle.

To set the extinguisher in operation, grasp the bottom handle with the left hand and turn the extinguisher upside down. Release the ring top handle, but continue holding the hose in the right hand to direct the stream.

Gas Cartridge

Gas cartridge and loaded stream extinguishers closely resemble soda-acid and foam types and are operated in much the same way. When these types are inverted, they must be bumped on the ground to rupture the carbon dioxide cartridge that supplies the pressure to expel the stream.

Vaporizing Liquid

Vaporizing liquid extinguishers of the pump-gun type generally are suspended in wall brackets. Remove the extinguisher by grasping the handle in the right hand and pulling outward. Hold the nozzle end in the left hand with the index and middle finger straddling the nozzle tip. On the way to the fire, twist the handle to unlock it and, if the device is of the air pump type, move the index finger over the nozzle tip and pump up pressure. To expel the stream, move the index finger back and pump steadily and vigorously with the right hand.

Larger sizes—1, 2, and 3-gallon capacity—are sometimes provided for special use. They are carried to the fire by the handle at the top and operated by hand pump or by stored pressure. To operate the pump type, rest it on the floor, and pump with the left hand while aiming the hose stream with the right. The stored pressure type is operated by opening the valve provided on the head castings, while the right hand holds the hose nozzle.

Carbon dioxide extinguishers are carried to the fire with the left hand, by the handle provided for the purpose. To operate, rest the extinguisher on the ground, pull the locking pin out, take the horn-like nozzle in

(Continued on page 294)

Shakeproof engineer studying stresses produced by screws in plastics.



HE CAN TELL YOU *How to Fasten* **PLASTIC Parts!**

**SHAKEPROOF OFFERS A
SPECIALIZED ENGINEERING SERVICE
GEARED TO HELP YOU IMPROVE PRODUCT
PERFORMANCE AND REDUCE PRODUCTION COSTS!**

In the assembly of plastic parts, each application requires a fastening most suitable to the particular material used, the construction requirements and the product's final use. The type, size and number of fastenings that are to hold each part are of utmost importance in achieving improved product performance. They also affect the speed of assembly and thus, the cost of production.

Shakeproof engineers have studied plastic fastening problems for years and are ready to analyze your applications. Through special laboratory tests they can make recommendations on fastening methods which will speed assembly, eliminate unnecessary parts, reduce operations and lower production costs.

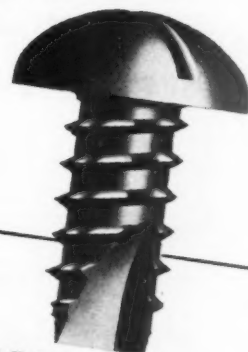
Write today—one of our field engineers will be immediately assigned to help you!

SHAKEPROOF inc.
"Fastening Headquarters"

Distributor of Shakeproof Products Manufactured by ILLINOIS TOOL WORKS

2501 North Keeler Avenue, Chicago 39, Illinois

Plants at Chicago and Elgin, Illinois • In Canada: Canada Illinois Tools, Ltd., Toronto, Ontario



**SHAKEPROOF
TYPE 25**

THREAD-CUTTING SCREWS
Actually cuts its own thread in plastics—eliminates taps, tapping operations and inserts. Snug, tight fit, always certain.

Write today
FOR FREE TEST KIT No. 10



Shakeproof Lock Washers
With Exclusive Tapered-
Twisted Teeth



Shakeproof Type 1
Thread-Cutting Screws
for Metals



Sems Fastener Units
Pre-Assembled Shakeproof Lock
Washer and Screw



Shakeproof Cowl
Fasteners... "The Quick-
Opening Lock"

PHENOL FIBRE

SHEETS, RODS, TUBES

A material of high dielectric strength, unusually resistant to water, oil, and chemicals. Standard size sheets approximately 48" x 48". Rods and tubes are available in all standard sizes. Fabricated parts are made to order. Submit blueprints for free engineering advice and estimate.

* * *

SILENT GEAR STOCK

Laminated Phenol fabric stock for silent gear blanks is strong, long-wearing, resilient and oil- and water-proof. Standard size sheets run approximately 48" x 48". Large size sheets cut more gears with less waste.

TAYLOR FIBRE COMPANY

NORRISTOWN, PA.

Stocks are carried by

TRI-STATE SUPPLY CORPORATION

SAN FRANCISCO
554 Bryant Avenue

LOS ANGELES
544 S. San Pedro St.

(Continued from page 292)

the right hand, and turn the valve counter-clockwise with the left to release the gas.

Pump tank extinguishers are carried to the fire by means of the top handle. The pump is operated by the left hand, while the right hand aims the hose stream.

Most incipient fires can be put out in a fraction of a minute, if the extinguisher operator knows how to use his equipment to best advantage.

In fighting a fire in ordinary combustibles (wood, paper, textiles, etc.), the extinguisher stream should be aimed at the base of what is burning, and not at the smoke and flames. Application should be continued until the fire is completely out. Then the operator should search the remains for glowing embers and drench thoroughly any that he finds.

Fires in flammable liquids generally fall into two categories—those in containers of liquids, and those in spills. If a foam, vaporizing liquid or loaded stream extinguisher is used, the operator should play the extinguisher stream against the far inside wall of the container just above the burning surface. This will avoid splashing and permit a natural spread of the extinguishant back over the burning surface. Where possible, the operator should walk around the container while directing the stream, so as to get maximum coverage during the discharge period. Where an operator using a foam or loaded stream extinguisher must remain at a considerable distance from a container of burning liquid, the extinguishant, directed at a high angle, may be allowed to fall lightly on the burning surface. In no case, however, should the stream be directed into the burning liquid.

If a carbon dioxide extinguisher is used, best results can be obtained by directing the discharge as close to the burning surface as possible, starting nearest the operator and then progressing forward, moving the discharge horn slowly from side to side. The discharge should be continued even after the flames have been extinguished, to cool the liquid and prevent a possible reflash.

In fighting fires in spills, the operator should put out the flames nearest him first, and then slowly sweep out the fire as he advances along its path.

Electrical Equipment Fires

Fires in electrical equipment should be fought the same way as those in ordinary combustible materials. If vaporizing liquid or carbon dioxide extinguishers are used, the operator can advance as close to the fire as necessary before the current is turned off—though best practice is always to turn off the current first. If water or water solution extinguishers are used (though they are not recommended for fires in electrical equipment), the equipment must be made electrically dead before application begins; otherwise damaging short-circuits can result and, if the voltage is high, a harmful charge may travel up the hose stream to the operator.

A few general safety rules should be kept in mind. The operator should stand as far from the fire as conditions, and effective use of the extinguishing agent, will allow. In the case of a 2½-gallon soda-acid extinguisher, the effective horizontal discharge length is from 30 to 40 feet; in that of a 15-pound carbon dioxide type, about six feet. The operator should maintain his position between the fire and an exit to permit ready escape; and, if the fire is outdoors or in the path of a strong draft, he should stand to windward (his back to the wind). As soon as the fire is out, the area should be thoroughly ventilated.



Let Anchor's WARTIME SERVICE Solve Your Fencing Problems

TODAY your industrial fencing problems are complicated by wartime restrictions—so get the benefit of Anchor's special wartime service! Although restrictions make it impossible for you to obtain standard Anchor Fence (illustrated above) unless your problem deserves special government consideration, acceptable substitutes, shown at right, are still available under the usual priority regulations—and you can count on expert Anchor Fence Engineers to find a practical answer to your needs.

Experienced erecting crews operating out of Anchor's 16 branch offices can erect any of the fences pictured, quickly and effi-

ciently. If you require some other type of barrier, such as a board fence or concrete wall, Anchor men can erect it quicker and better. If you want your present fence moved to a new location, or if it needs realigning, repairing, or painting, call in our experienced men. Our nationwide organization means fast service.

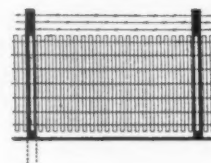
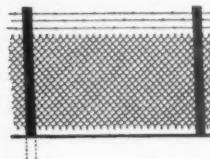
Consult the classified section of your telephone book or write for address of nearest Anchor representative. No obligation. You'll find that Anchor's specialized knowledge can save you time, money, and headaches on any fencing problem. Anchor Post Fence Company, 6615 Eastern Avenue, Baltimore-24, Maryland.

**ANCHOR
FENCE**

ON ANY FENCING PROBLEM CALL ANCHOR

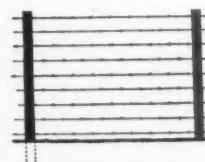
Anchor Makes, Erects, Moves, Repairs Every Type of Fence!

- 1 -
*Chain Link
and
Barbed Wire
on
Wood Posts*



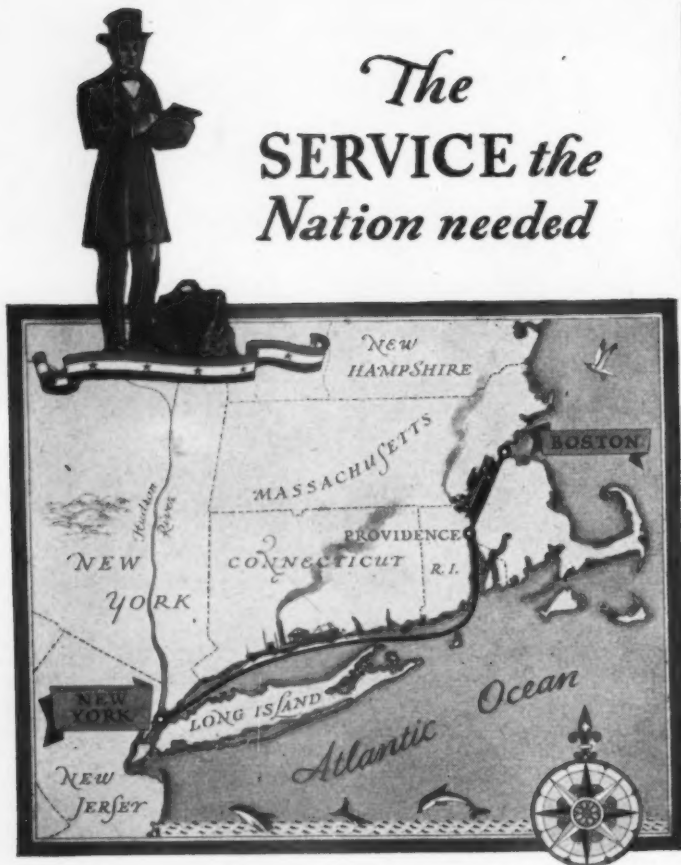
- 2 -
*Woven Wood
and
Barbed Wire
on
Wood Posts*

- 3 -
*Barbed Wire
on
Wood Posts*



Anchor Also Makes:

- Chain Link Fences
- Woven Wood Fences
- Barbed Wire Fences
- High Board Fences
- Indoor Factory Enclosures
- Safety Screening Devices
- Factory Window Screening
- Factory Partitions



The SERVICE *the* Nation needed

SET TO GO, but held by a brake. Goods ready to move faster and surer, but no adequate way to do it. That was America's business situation in 1839. William Harnden had the idea for a railway express service. "I'll carry your goods for you," he advertised to Boston and New York. And he did, at *passenger speed* in a wooden car between Boston and Providence which was where the railroad ended; and between there and New York by steamboat. That was the transportation service idea people and business needed. And as the idea grew, it helped broaden our young nation, unite its spreading frontiers and hasten its growth and development.

Today, 105 years later, Railway Express is performing by land, water and air the same basic personalized express service. The goods it carries now are mostly war materiel. In peacetime, they will again encompass every conceivable personal item as well as the products of industry.

You, as a shipper, can help us carry our share of America's wartime transportation load and serve you better by doing two simple things. Pack your shipments securely . . . address them clearly. Our century of experience proves that "a shipment started right is half-way there!"



NATION-WIDE

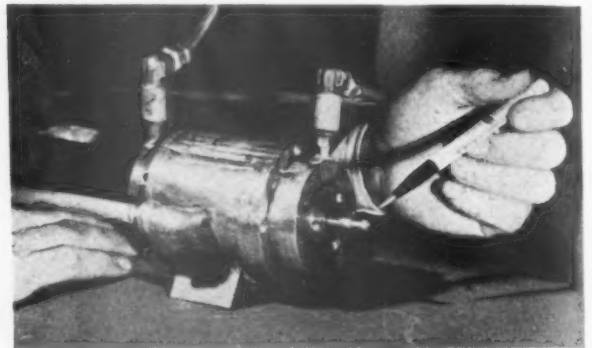
RAIL-AIR SERVICE

MOTOR OPERATES AT 120,000 RPM Three H.P., Weighs Seven Pounds

AN electric motor operating at the record-breaking speed of 120,000 revolutions per minute, or more than seven million revolutions per hour, has been built and tested by General Electric. The motor was developed for application to internal grinding machines used in finish grinding small holes, many less than $\frac{1}{4}$ inch in diameter, in vital war parts.

Although the motor will not be available for general use until after the war, another possibility for its use is in driving small drill chucks for drilling tiny holes in metals, using drills $\frac{1}{32}$ inch in diameter and less.

According to F. W. Baumann and D. H. Ware, G-E motor engineers, the surface speed required to produce a high-grade finish economically by grinding should be



Seven Million Revolutions Per Hour—General Electric's New 3 H.P., 7-lb. Motor.

about the same whether grinding a large or a small hole. A medium size wheel rotating at a moderate speed gives the requisite surface speed but for small holes only a tiny grinding wheel can be used, hence the high rotating speed is essential.

With normal voltage applied at 2000 cycles, the new motor reaches full speed in less than a second. It is rated 3 horsepower and weighs but seven pounds as contrasted with the standard 3-hp, 1800-rpm motor which weighs 105 pounds. The motor is so small that it fits into the palm of a person's hand, while its rotor is scarcely larger than a man's thumb.

Tests the motor has passed successfully at 120,000 rpm include eight-hour continuous runs at rated horsepower as well as grinding tests with a tiny grinding wheel mounted directly on the motor shaft.

1 1 1

BRITISH SALVAGE RAILINGS

ACCORDING to the British Information Service, in forty-five months of war ending July 1943, the people of Britain removed iron and steel railings from their properties amounting to 500,000 gross tons, while steel from bombed buildings was reclaimed to the tune of 490,000 gross tons. The British Information Service pointed out that of the 3,500,000 properties from which the metal railings were removed, the owners of only 130,000 (or $\frac{1}{27}$ th of the total), had claimed compensation for the railings.

Heavy industrial scrap in Britain is collected through the medium of regional and county offices of the Ministry of Works, corresponding to our WPB Industrial Salvage Branch.

DELTASEAL IS THE ANSWER TO MANY NEW PACK- AGING PROBLEMS...

Possibly to yours



WHATEVER YOUR PROBLEMS in the postwar packaging of your products, new or old, it's likely that you'll find the answer among the wide range of bags Bemis makes.

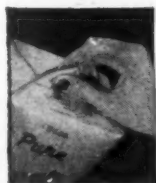
FOR INSTANCE, IF YOU HAVE A FREE-FLOWING, POWDERED OR GRANULAR PRODUCT to sell at retail, the Bemis Deltaseal System of Packaging, with *proven* sales power, is a very probable answer. Deltaseal Paper Bags win choice display space because they're so easy to stack and handle. They attract buyers by their trim appearance and colorful printing. They bring repeat business because customers find them so convenient to use. And in your packaging departments the efficiency of the Deltaseal closing method saves time and money.

IF YOU HAVE OTHER TYPES OF PRODUCTS or merchandising problems, the answer may be in other Bemis Bags... waterproof, multiwall, cotton or burlap, possibly.



THE REAL KEY lies in the Bemis staff of packaging engineers, backed by 86 years of experience. If the bag you need isn't already in the Bemis line, they'll tailor-make one to fit your requirements to a "T".

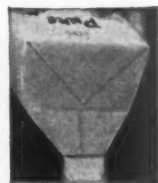
DELTASEAL BAGS Have the "Easy-Pour" Spout



1. Pull
UP FLAP



2. Cut
ON DOTTED LINE



3. Pour
LIKE THIS

Nearly everything that American families eat, wear or use may make at least part of the journey to them in a Bemis Bag.

BEMIS BAGS



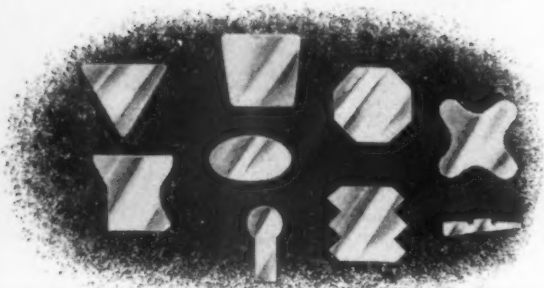
BEMIS BRO. BAG CO.

OFFICES: • Baltimore • Boston • Brooklyn • Buffalo • Charlotte
Chicago • Denver • Detroit • East Pepperell • Houston • Indianapolis
Kansas City • Los Angeles • Louisville • Memphis • Minneapolis
Mobile • New Orleans • New York City • Norfolk • Oklahoma City
Omaha • Peoria • St. Helens, Ore. • Salina • Salt Lake City • San Francisco
Seattle • Wichita • Wilmington, Calif.

BETTER BAGS FOR 86 YEARS

Invest Today in War Bonds

PAGE *Shaped* WIRE



SHAPED wire belongs in production that is coming with reconversion—belongs as never before.

The Shaped Wire you plan to use may be Carbon Steel, Armco Ingot Iron or Stainless Steel. Whatever it may be, think of **PAGE**—for wire has always been the business of **PAGE**. And it has been part of our business to develop Shaped Wires to meet a wide range of special manufacturing requirements—in end section areas up to .250" square and widths up to $\frac{3}{8}$ inches.

• • •

You will find it very much worth your while to discuss your planned use of Shaped Wire with **PAGE** possibly well in advance of the time of re-conversion. We may be able to help you save many precious production hours and reduce production costs.

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In Business for Your Safety

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BRIDGEPORT • CONNECTICUT

PETROLEUM WAXES VITAL

**Play Important Role in Both
War and Civilian Products**

WITHOUT the American oil industry it would be difficult to preserve the Army and Navy rations and keep the armed forces ammunition dry, according to the Petroleum Administration for War.

Petroleum waxes are a little-known, but highly important by-product of the oil industry. They coat paper milk containers, butter cartons, bread wrappers. They protect frozen and dehydrated foods and meats, as well as tea, coffee, chewing gum, cigarettes and candy. Deputy Administrator Ralph K. Davies said:

Two Types for Packaging

"Petroleum waxes used in packaging are of two types, paraffin waxes and microcrystalline waxes, both paraffinic hydrocarbons, but differing in their physical characteristics.

"Paraffin waxes have been used in small quantities in packaging foods for forty years. Military demands today are focusing attention on the harder-to-get microcrystalline waxes. Because of their flexibility at extremely low temperatures, and because a very thin film of the wax will maintain a high resistance to transmission of moisture, 60 per cent of the entire output for 1943 of this petroleum product went to packaging field rations for overseas service men, to the manufacture of ordnance wrapping and to 'dip-coating' of Army ordnance and ordnance metal replacement parts. Microcrystalline wax is also used for bomb desensitizing and airplane de-icing compounds, and in proofing Army shoes against mustard gas.

Strangely enough, wax can be more moisture-vapor proof than tin, it is found. Ordnance plants are now waterproofing aircraft ammunition packages by a new double-wax dip process. Experience of our armed forces reveals that water often penetrates the hermetically sealed metal-lined wooden boxes of ammunition when they were hurled from the ship.

"The wax content of the wax-bearing crudes is only about three-fourths of one per cent; however, last year approximately 50 refineries in this country turned out a record volume of 380,000 tons of all petroleum waxes. But so critically scarce are micro-crystalline waxes that the 1944 production, which will total approximately 60,000 tons, is being allocated in accordance with the relative importance of the various purposes for which it is intended. Refined and crude scale waxes are also short, but are not on allocation."

New Uses Here to Stay

Cosmetics, printing inks, adhesives, electrical insulations, bottle caps, floor and automobile polishes require many tons of petroleum waxes. Lower and less critical grades of waxes go into the manufacture of matches and crayons. Thirty tons of micro-crystalline wax were allocated to the manufacturer of one article, a preparation for the hair, sold only to service men. Born of the war, some of the newer uses of waxes are here to stay, particularly wax laminated paper packaging for tobaccos and cheese instead of paper and foil, as well as chip board containers with wax-laminated glassine liners for foods and bakery goods.

In addition to their high resistance to water-vapor transmission, other important properties of petroleum waxes are their practical freedom from odor and taste, their chemical inertness, and their change from solid

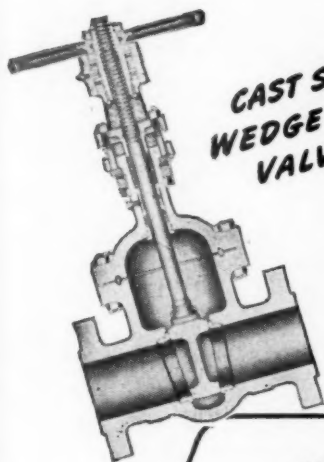
(Continued on page 300)

Power or Process Piping Systems CRANE can equip them 100%

Pipe
Pipe Bends, Flanged
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Automatic Stop Check
Valves
Pipe Supports
Gaskets and Studs
Gate Valves
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Screwed Fittings
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Separators
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**CAST STEEL
WEDGE GATE
VALVES**

ONE STANDARD OF QUALITY

The whole system is more dependable because there's one high standard of quality—adequate for the need—in every part. In Crane Steel Gate Valves, for example: Straight-through ports minimize turbulence, erosion, resistance to flow. Strong tee-head disc-stem connection, ball-bearing yoke, and non-corrosive stem bearings assure smoothest operation. Adequate stem power and extra long disc guides make seating positive.



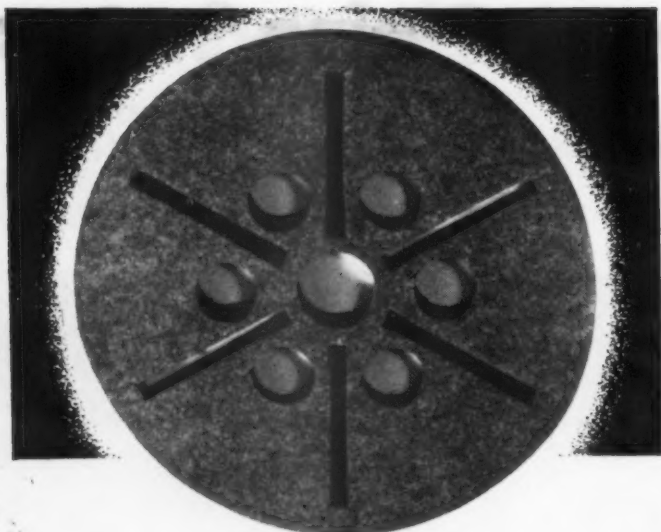
Steam Piping for Double-Boiler Hook-up

ONE SOURCE OF SUPPLY . . . ONE RESPONSIBILITY FOR ALL MATERIALS

Only a source as complete as Crane can give you these advantages. For power, process, or any other piping system—not only the valves and fittings, but every part, from pipe to gaskets and studs, are regularly available from Crane. Where else, but in the world's greatest line of piping materials, could you expect a selection of equipment that always meets your needs—of quality that's always dependable? For, back of it stands Crane Co.'s 89-year leadership in the piping field. CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Ill.

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**VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS**



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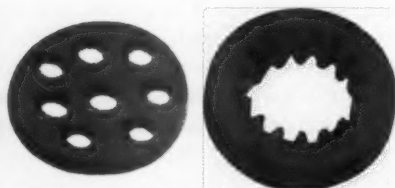
Felt

- Gaskets
- Channels
- Washers
- Insulation
- Mountings
- Wicks and Seals

Felt, as offered today by Western, represents the sum of 45 years experience in manufacturing and engineering this versatile material.

Your felt needs are met by shapes, sizes, and qualities especially engineered to take full advantage of felt's special properties: resiliency, flexibility, compressibility, resistance to heat, age, alcohol, oils, etc.

Felt's special properties—felt's thousands of uses—plus the reliability of Western service backed by years of experience, qualifies the company and its felt to fill your every requirement. When you buy Western, you get *more* than felt.



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WESTERN
Largest Independent
Manufacturers and Cutters of
Wool, Hair and Jute Felts

Felt

(Continued from page 298)

to liquid state over a narrow range of temperature.

Improved methods of wax application have made possible the production of commercial wax papers with moisture transmission rates over a 24-hour period as low as two tenths of a gram per 100 square inches at a temperature of 100 degrees Fahrenheit.

Because of their higher melting points and flexibility, micro-crystalline waxes are considered superior for military packaging, but micro-crystalline and paraffin waxes may be combined in any proportion, and tests are being made of new compounds requiring less micro-crystalline.

1 1 1

NO DEGRADATION IN PAINTS

New Paints Said to Adequately Meet
Needs as Protective Coatings

MANUFACTURERS of both industrial finish and trade sales type paints have been giving the public adequate and substantial coating despite wartime restrictions, B. M. Belcher, Chief of the Paint, Varnish and Lacquer Unit of the War Production Board's Chemical Division, told a meeting of the New England Paint, Varnish and Lacquer Association at Boston, Mass.

"We have been interested lately in trade journal discussions about the degradation of the quality of trade sales paints which a few manufacturers have claimed is underway", Mr. Belcher said. "The WPB Protective Coatings Section is interested in this situation, particularly where some of our orders, such as M-332 on linseed oil, are blamed for some of the supposed degradation. We wonder what good can come of such discussions.

"We wonder, for example, just what is meant by 'degradation of quality?' Is durability or protection of the surface the principal factor in connection with quality, or can such other factors as hiding, and whiteness, gloss and drying be considered in connection with quality?"

"The changing raw material situation which started prior to the war has forced the paint formulator to constantly alter the formulation of his various lines. A lack of certain resins and oils has constantly changed the characteristics of paints. The present non-availability of colors will further affect the paint situation and the shortage of oil has been a definite factor.

"Only Words" Against Order

"But has the ability of paint to protect the surface been affected? Generally speaking, we think not. We believe paints supplied by manufacturers today are perfectly adequate for the job at hand, which is the protection of the property of this country. To date we have received no evidence to substantiate the charge that paints have been degraded as a result of Order M-332. To date we have seen only words against the order.

"On the other hand, we have evidence based on laboratory and field tests which indicates that paints made under the order are equal to, and in some cases superior to paints made under formulating methods prior to the war. We do not say that no degradation has taken place because of decreased oil content. We do say that all evidence is to the contrary and we do believe that no degradation has occurred."

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REGULAR TOOL MAKER
for *Firthite* tools**

ANNOUNCING A NEW CONVENIENCE TO FIRTHITE USERS

Through new arrangements with hundreds of "authorized" Tool Makers located in every industrial center in the United States, they are now prepared to supply Firthite-tipped tools for quick

delivery. We suggest that you contact your **REGULAR TOOL MAKERS** for Firthite Sintered Carbide. In case you do not immediately find the Firthite tool maker or distributor nearest you, any Firth-Sterling Office will gladly give you the name of "authorized" Tool Makers who will now supplement our own facilities.



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HERE'S WHAT TO DO BEFORE THIS HAPPENS



FORGED STEEL FITTINGS



Forged Steel Screw End and Socket Welding Pipe Fittings are made by Watson-Stillman in a full line of Elbows, Tees, Crosses, Laterals, Couplings, Reducers, Bushings, Caps, Plugs and Unions for standard or extra heavy pipe lines. All W-S Fittings have uniform wall thickness, maximum wall strength and uniform material characteristics specified and controlled by W-S Engineers. Ask for Bulletin A-3.

VALVES



For use on standard and extra heavy pipe lines, Watson-Stillman supplies bronze or forged steel Globe Valves, Stop Valves, Angle Valves, Needle Valves and Check Valves of standard types in a wide range of sizes, for screwed, socket welding and flanged connections. Ask for Bulletin A-4.

HYDRAULIC JACKS



Watson-Stillman builds standard hydraulic jacks in Independent Pump, Vertical Outside Pump, and Horizontal Outside Pump types. Capacities of 10 and 500 tons. Used by shipyards, contractors, builders, drydock and wrecking companies, machine shops and oil drillers. Ask for Bulletin 710-A.

HAND PUMPS



For operating jacks, small hydraulic tools, and general testing purposes, Watson-Stillman manufactures Single Plunger and Double Plunger Hand Pumps with large, medium and small tanks. Ask for Bulletin 240-A.

WIRE ROPE SHEARS



On all sorts of construction and maintenance jobs, Watson-Stillman Wire Rope Shears are time-saving equipment. Also suitable for cutting iron bars and rods. Ask for Bulletin 740-A.

For quality at no extra cost specify Watson-Stillman when you buy fittings, valves, jacks, pumps and shears. The Watson-Stillman Co., Roselle, N. J.

WATSON-STILLMAN

DISTRIBUTOR PRODUCTS DIVISION

Designers and Manufacturers of Forged Steel Fittings, Valves, and Hydraulic Equipment.

5315

CIVILIAN PRODUCTION

No Expansion at Expense of War Effort Says Nelson

"IN the period that lies ahead, we dare not allow the American economy to become unbalanced even temporarily", declared Donald M. Nelson, Chairman of the War Production Board at a recent Washington meeting. You cannot get the kind of cooperation you need, you cannot produce on the scale necessary for this kind of war when your economy is out of kilter. Now I put it to you bluntly that we are going to have even a harder time keeping the economic balance during the remainder of this war, than in the past two years.

"The facts are plain. Reserves of certain types of war material are already making it possible to close down some war factories. The workers of those factories in most cases will be able quickly to find employment in other war industries, where they are badly needed. Nevertheless, in certain local situations there may be some manpower available, if only temporarily; there will be facilities available, and there will be materials available. Right now pressure is being felt to permit industrial plants to use available resources in making products that our civilian consumers want:

"Just as in January, 1942, many people could not understand why the government did not wipe out the civilian economy, so there are many today who cannot understand why we do not permit an immediate return to large-scale civilian production. Now as before, however, the War Production Board is determined to preserve a sound balance in its policy. That policy can be summed up as follows:

"We will expand civilian production as it becomes possible to do so without interference with the war program, but we will permit no expansion at the expense of essential military production. Today critical shortages in some areas of manpower, of certain component parts, and of certain materials make it necessary to move with great caution in permitting any expansion of civilian output whatever.

1 1 1

WARTIME TEXTILE PLASTICS

Cotton Basis of New Laminated Plastic

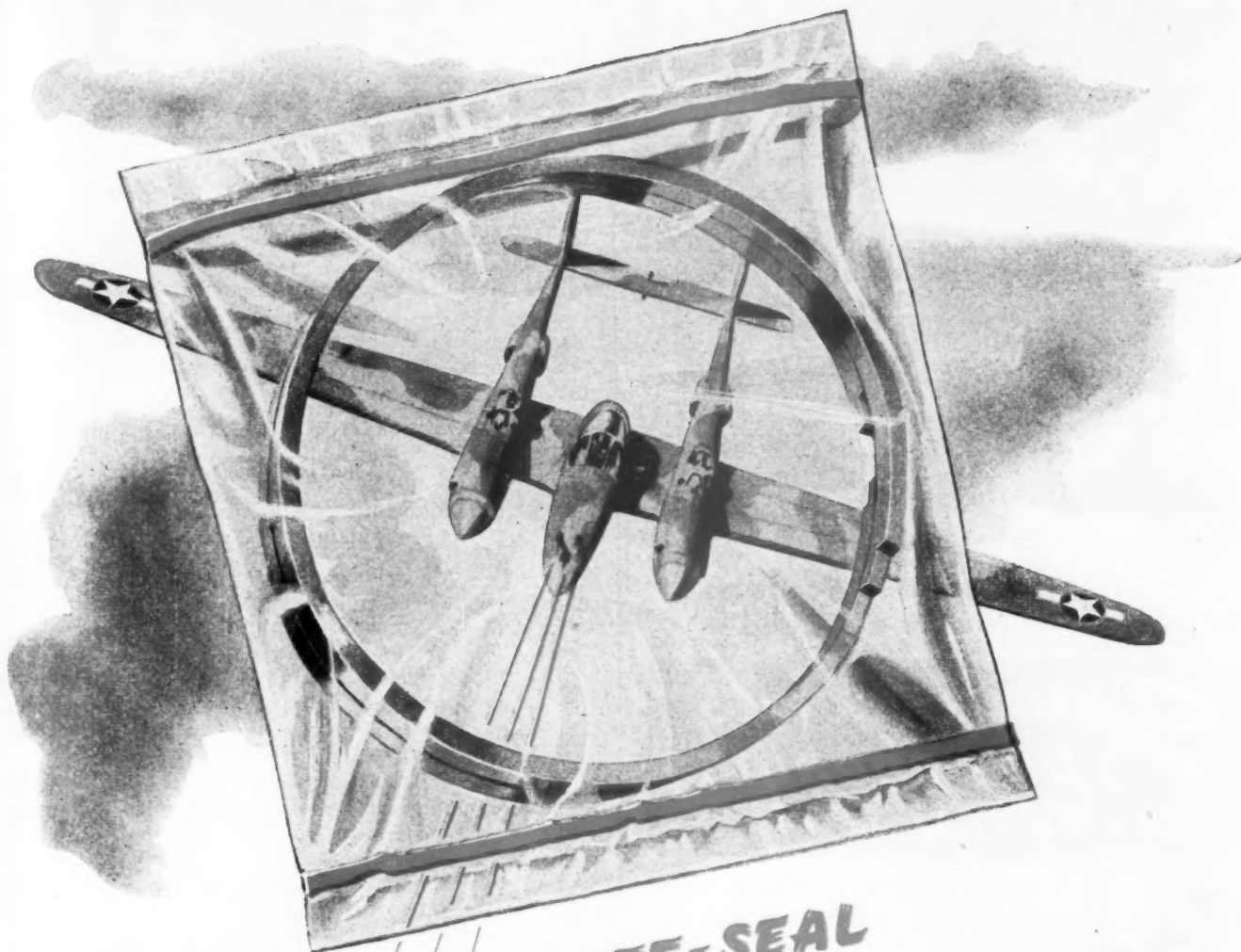
HOW textiles produced in Southern mills have been transformed into laminated plastics of fibrous materials in sheet form immersed in and coated with synthetic varnish to harden under heat and pressure to be utilized in aircraft and other vital war uses has been demonstrated by the Formica Insulation Company, Cincinnati.

R. W. Lytle, vice president in charge of special engineering states that cotton goods, when treated and hardened under pressure undergo a transformation to make textiles important units of fighting planes and other war implements. Rolls of duck and 2.50 sheeting are passed through a bath of varnish, then through a drying oven before being cut into desired lengths. The short sheets are piled one upon another and placed in a hydraulic press, the platens of which are hollow.

Applied pressure—up to 3,000 pounds per square inch is followed by heating the platens by means of introduction of steam, the mass remaining in the press from 40 to 60 minutes per inch of thickness until it becomes an insoluble solid.

This procedure, he explained, is followed in the For-

(Continued on page 304)



IT'S "IN THE BAG" FOR OUR BOYS

Piston rings in TITE-SEAL Waterproof Cellophane Bags reach fighting fronts in prime condition. So do thousands of other military parts—bolts, bearings, gauges, etc.—for which TITE-SEAL Bags are *approved* Grade A, type III, wrapping material in Packaging Methods 1 and 1A.

Availability is only one reason for TITE-SEAL popularity; visibility is another. One look identifies the contents, sealed against rust and corrosion. Recommended by Forest Products Laboratory.

The unmatched advantages of TITE-SEAL Bags proved in war, will protect in peace, parts and articles for shipment and stock.

LOXTITE PARTITIONS • "TITE-SEAL" CELLOPHANE
BAGS AND LINERS • MULTI-COLOR PRINTED CELLO-
PHANE AND GLASSINE IN SHEETS OR ROLLS

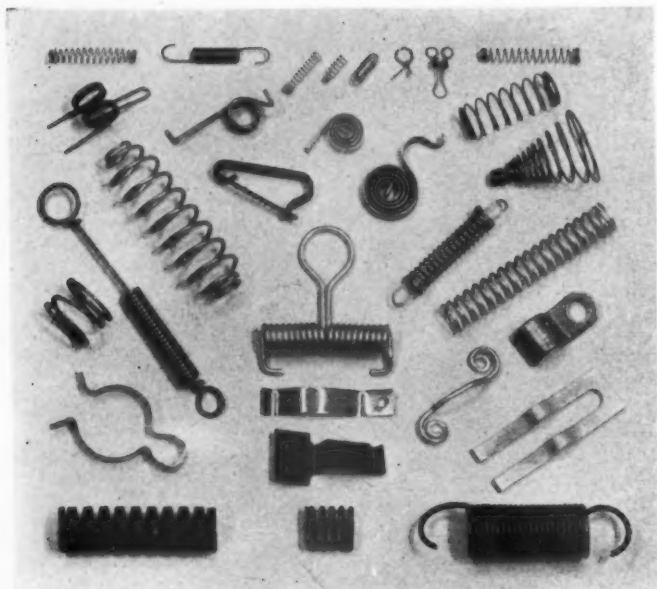
Patents Applied for



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**As Peacetime Products
are Re-designed —**

**Spring Needs
are changing
every day**



in every post-war product, every part is important — every working part is doubly important — and few working parts are more vital than SPRINGS.

For example, dimensional and load bearing factors must be kept uniform, forming and finishing must be faultless, so that accuracy in action may be as nearly absolute as possible. From close control of metallurgical characteristics in the raw material, to final inspection and testing, Reliable does an outstanding job. We are proud of the proficiency of our craftsmen, of the excellence of our modern equipment, of our record on deliveries, of our steady customers.

To us, your individual requirements are a special problem. If your spring designs are already determined, send us your blueprints and specifications. If not, use without obligation Reliable's competent engineering service.

Send us your specifications and drawings.
Write for Reliable Spring Catalog No. 44

THE RELIABLE SPRING & WIRE FORMS CO.
3167 Fulton Rd. Cleveland, Ohio

Representatives in Principal Cities



(Continued from page 302)

mica technique for manufacture of sheets, tubes, rods or special moldings for application in both Army and Navy aircraft, for Signal Corps activities and numerous mechanical and electrical insulation parts in Navy ships.

That cotton has been and is now used in the greatest poundage output of the Formica material. Vigilance on the part of textile workers to keep out defects of twist and weave is the foundation upon which succeeding operations are built to produce a finished product which will exceed Army-Navy specification requirements.

The Formica engineer reported that while cotton is being used at the Cincinnati plant in "the greatest poundage output" this fabric "has no monopoly in the plastics field as paper, glass cloth, woven asbestos and rayon are used".

LIQUID AIR

Health and Safety Hazards and Precautionary Measures

L IQUID air is a light blue liquid of a density approximately equal to that of water. It maintains itself at a temperature somewhere between -319 degrees F., the boiling point of nitrogen, and -297 degrees F., the boiling point of oxygen.

Its outstanding properties, as compared to ordinary air, are the greatly increased rate of combustion which it produces and the extremely low temperature.

It is produced by compression of air to approximately 200 atmospheres, removal of carbon dioxide and water, and cooling by expansion.

By far the largest amount of liquid air produced is used for the preparation of compressed oxygen, nitrogen, and the rare gases of the atmosphere.

Small quantities are used in the preparation of explosives of the type known as "Oxylignite" in Europe and "L.O.X." in this country.

Small quantities are used in plants for the cooling of parts to produce "shrink fit" and in physical and chemical laboratories for various refrigeration purposes. These are the uses with which this digest is concerned.

Safety Measures

Injuries may be produced by bringing liquid air into contact with the skin. Processes should be designed so as to minimize the probability of splashing. Cup goggles and impervious gloves, at the least, should be used.

The liquid should be used only in containers open to the atmosphere. Dangerous high pressures will build up with great rapidity, depending mainly upon the rate of heat transfer to the liquid, if the container is closed.

Care should be taken to prevent liquid air from coming in contact with combustible materials, including oil and grease. L.O.X. explosive, of about the same strength as 40% dynamite, is produced by soaking carbon black or charcoal in liquid oxygen. Such mixtures are extremely sensitive to detonation by shock, friction, or impact. Detonation from spilled liquid air is not likely but is definitely possible. Violent combustion is very probable.

Sources of ignition such as flame or sparks should be kept away from liquid air because of the violent combustion it produces in other materials.

Small amounts of liquid air are frequently handled in glass Dewar flasks. These flasks occasionally collapse, particularly if liquid air is splashed on the joint at the

(Continued on page 306)

"Start Number One!" . . . and an unfailing electric whip lashes thousands of sleeping horses to a thundering roar of readiness. Then three more flicks of the lash, and the bomber sprints down the runway to leap into the air . . . target-bound.

That purple ignition spark is the *spark of life* for war-plane crews . . . lifting them, keeping them aloft, bringing them back to base. And a sense of this mortal obligation is carried deep in the minds of all at Veeder-Root who produce the magnetos that supply this spark . . . and of those who patiently test them far beyond the ultimate demands that will be imposed.

And why is part of the nation's vital magneto production given to men and women who have previously made counting and computing devices? Because *this responsibility must be in good hands, beyond the shadow of a doubt.* Pilots, crew members, and their families *can count on these hands* to keep a plane's spark of life ready, strong, and steady . . . just the way they have been doing, all along. And there are no more capable and conscientious hands than those long-trained in mathematically honest mechanics — which are the basis of counter-manufacture.

HOW TO GIVE A BOMBER'S ENGINES THE SPARK OF LIFE



The Counting House of Industry



VEEDER-ROOT

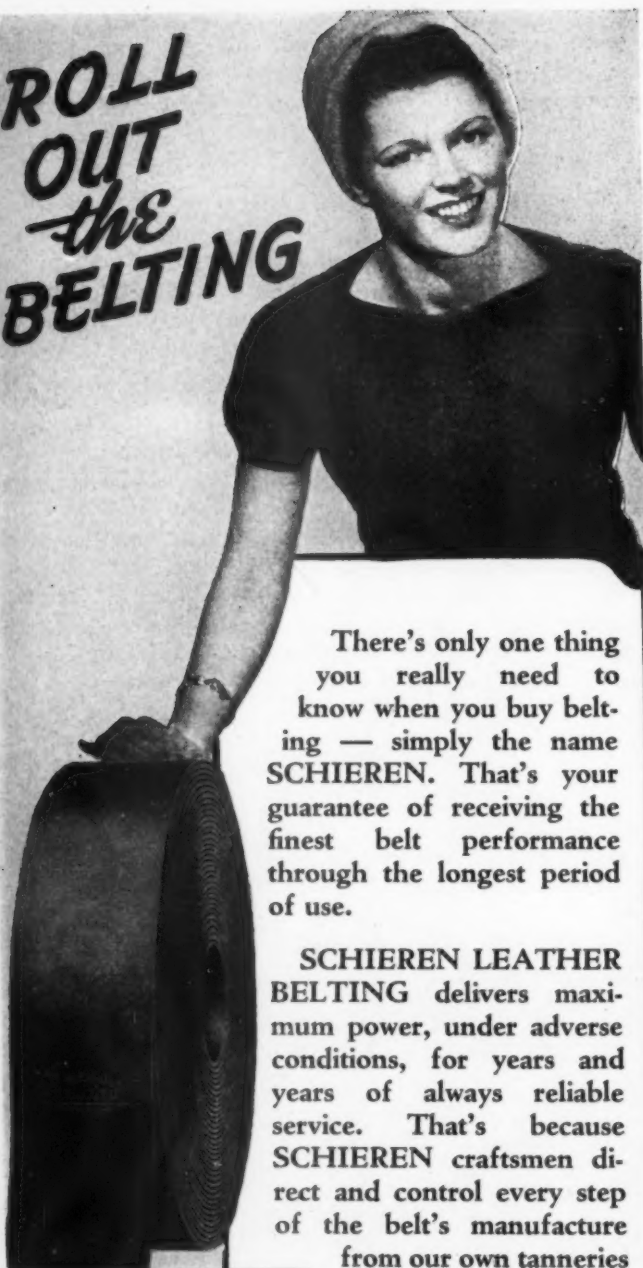
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ROLL OUT the BELTING



There's only one thing you really need to know when you buy belting — simply the name **SCHIEREN**. That's your guarantee of receiving the finest belt performance through the longest period of use.

SCHIEREN LEATHER BELTING delivers maximum power, under adverse conditions, for years and years of always reliable service. That's because **SCHIEREN** craftsmen direct and control every step of the belt's manufacture from our own tanneries to final dressings.

We invite you to compare the quality and performance of a **SCHIEREN BELT** with that of any other. May we prove our point? Ask your nearest distributor — or write us direct.

**SCHIEREN'S
LEATHER**

BELT
modern designs

A SECTION B SECTION C SECTION

Any size belt can be made endless right on the job. Supplied in rolls — eliminates large inventory — a great space-saver. No need to match sets accurately because of tenacious pulley grip of leather side walls.

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(Continued from page 304)

neck. They should always be kept within explosion screens. In general, care should be taken in handling any materials which have been cooled to liquid air temperature until their properties in this condition are known. They may not resemble the properties at room temperature.

The introduction of a substance at room temperature into liquid air is always somewhat hazardous. There is a violent evolution of gas and there is likely to be considerable splashing of liquid. Employees doing this sort of thing should be instructed in the hazard and should always wear cup goggles, impervious gloves, and rubber or plastic aprons.

Health hazards: The only effects on the body are from the extreme cold and possibly from an increased concentration of oxygen in the immediate vicinity of liquid air containers. It can be considered essentially non-hazardous to health.

Further information on this subject may be procured from National Safety Council, Chicago 6, Ill.

1 1 1

NAIL-PULLING MACHINES PULL 40-PENNY SPIKES

Enhance Lumber Salvage

TWO ingenious nail-pulling machines, made out of scrap materials, are helping an Army Ordnance depot to achieve savings of nearly \$275,000 a month in dunnage lumber costs.

In one month, the Letterkenny Ordnance Depot at Chambersburg, Pa., used 950,000 board feet of dun-



Pull 300 Pounds of Nails Daily

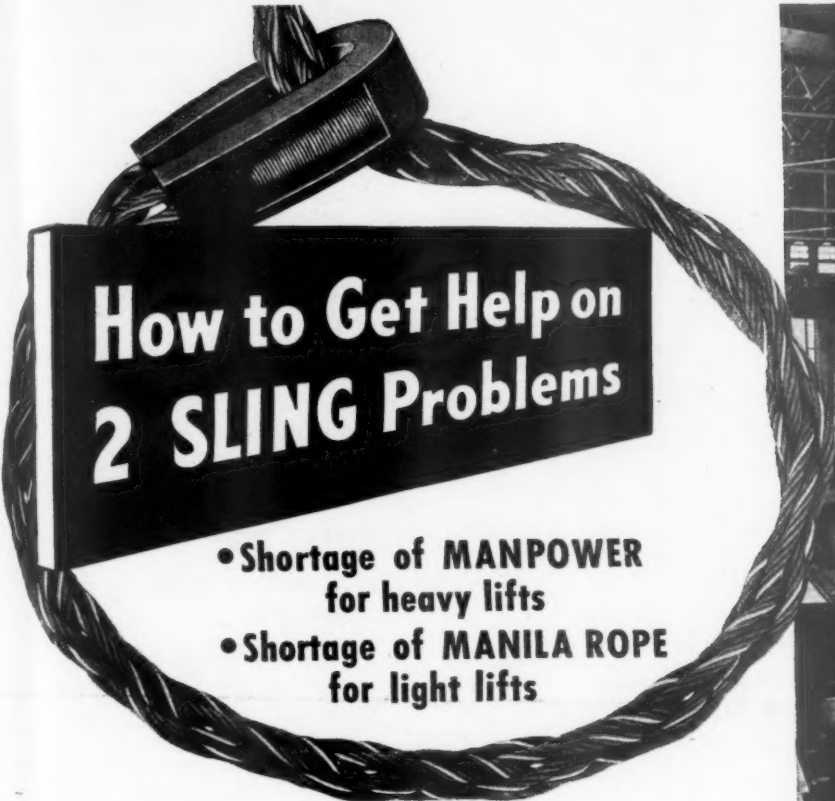
nage lumber. Of this amount, 670,000 feet was reclaimed lumber, processed with the help of the nail pullers. The lumber, originally received with incoming shipments of battle tools and ammunition from Ordnance arsenals and factories, was used to block, stay and brace outgoing shipments of Ordnance material. Dunnage lumber is also used in storing material in depot warehouses.

The nail-pullers, powerful enough to pull 40 penny spikes out of heavy oak timbers, make it possible to process 2,000 board feet of lumber an hour, or from 20,000 to 21,000 feet a day, and from 600,000 to 620,000 feet a month. The pullers can extract between 250 and 300 pounds of nails daily.

Fifteen women workers are employed by the lumber supply shop, and they straighten nails and hammer them partially through the wood so the puller claws can take hold.

Freed of nails, the lumber moves along a conveyor

(Continued on page 308)



How to Get Help on 2 SLING Problems

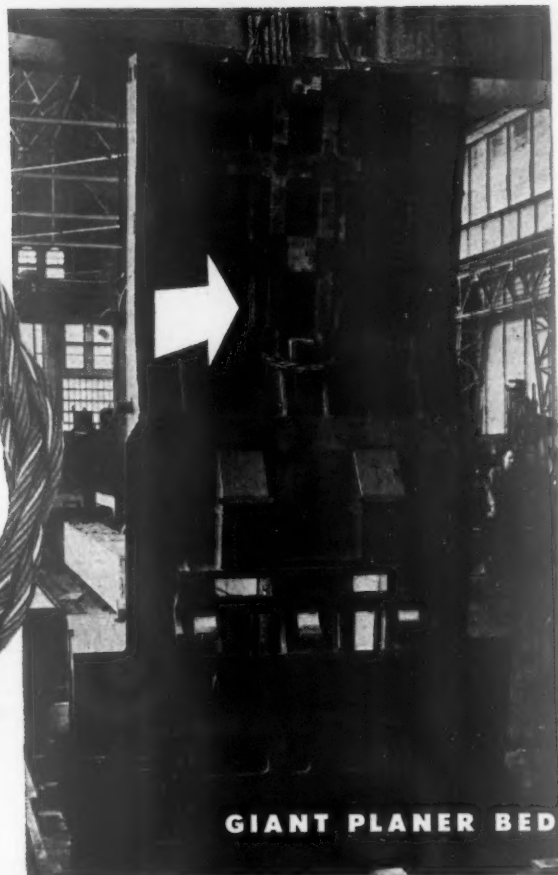
- Shortage of **MANPOWER**
for heavy lifts
- Shortage of **MANILA ROPE**
for light lifts

Would it help you, on a 20- or 25-ton lift, to have a sling that one man could handle, instead of two or three? Light weight is just one work-speeding advantage of Yellow Strand Braided Wire Rope Slings.* They're easy to attach . . . kink-resistant . . . free from corkscrewy effects—all because the patented braiding makes them flexible and relaxed. Still they possess the strength and uniformity of tough Yellow Strand Wire Rope. Employees like this *security*.

Not all sling difficulties have been problems of manpower or heavy loads. Many *light* sling users, deprived of Manila rope, are discovering that versatile Braided Yellow Strand Slings are pliable . . . responsive . . . safe for handling fragile, slippery or highly finished objects. Again it's the patented braiding that provides a soft, sure grip. As you check the wartime efficiency of your sling methods, let Broderick & Bascom's specialized Sling Engineers be of service. Write now.

Broderick & Bascom Rope Co., Saint Louis

Branches: New York, Chicago, Houston, Portland, Seattle
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*Patents: U.S., 1475859, 1524671, 2142641, 2142642, 2299568;
Canadian, 252874, 258068

Riggers' Hand Book—Shows sling types, fittings, capacities. Send for FREE copy.

4-TIME
WINNER



YELLOW STRAND

Braided Wire Rope SAFETY SLINGS



HARMONIZING WITH HARSHAW

WILL BRING YOU QUICK ACTION

TODAY... **RUSH** is the tempo in America's swelling song of production. Harshaw is trying to keep time with this fast tempo and production crescendo in filling and shipping customers' orders. When complete information is given... most orders are ready for delivery within 48 hours.

Customers harmonize with Harshaw's speedy delivery rhythm when writing complete information on their orders... priorities... allocation... where, how, and when to ship... these facts prevent discord in delivery expectation and blend our office and factory procedure into smooth, fast movement.

Harmonize with Harshaw. Prevent unnecessary delays. Write detailed information on your orders. Be explicit and we can both enjoy participating in the pleasant music of "**RUSH**"... for chemicals... for your laboratory or commercial use. There is no more appropriate time to start than **NOW**.

THE HARSHAW CHEMICAL CO.

1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

(Continued from page 306)

line to a saw where it is trimmed to get the various prescribed lengths desired for dunnage.

The nail-pullers were designed and developed by Lt. M. R. Chidakel, assistant maintenance officer at Letterkenny, who found two old discarded shapers, cleaned them, made a few mechanical changes and additions, and turned them into power tools. The pullers are saving many back-breaking hours of nail-pulling by hand.

Last summer, before the pullers were in operation, a crew of 30 women performed the reclamation work. The larger nails, imbedded in hard wood, had to be pulled by men. Considerable lumber was saved, but the work was hard and it took time. Ordnance officers estimate that 70 per cent more work is being accomplished under the new system.

ELECTRONIC ROBOTS

Check Motor Speed Up to
100,000 RPM

ELECTRONIC robots that read instruments far more accurately than a man can, and which automatically print their readings on a strip of paper are used to measure with high precision the speed of motors used in airplane wind tunnel tests, according to Everett S. Lee, engineer in charge of the General Engineering Laboratory of the General Electric Company.

Much information about the behavior of newly designed airplanes is obtained by testing models in a wind tunnel, he explained. These models are powered with small electric motors, corresponding to the gasoline engines of full-sized planes. In order that information about the performance of these motors may be extended accurately to the big airplanes, data about their operation must be determined with great precision. Mr. Lee explained that the mechanisms may be adjusted so that they give the equivalent of readings on a scale more than eight feet long.

The indications picked up by electron tubes, he explained, cause the rotation of a tiny thyatron-controlled motor, which in turn drives wheels carrying type for numbers. When the operator wants to take a reading he presses a button, and the type wheels print their setting at that moment.

Record Revolutions Up to 2000,000 RPM

Mr. Lee told the electrical engineers that these electron tubes, especially the phototubes which are sensitive to light, perform many other tasks far beyond the powers of the human eye. For example, they may look at the end of a spinning shaft, and record the number of revolutions per minute up to 100,000 rpm or 200,000 rpm, as such speeds become available.

"These measurements are just a few of many which have come from the photoelectric recorder, an instrument developed in peace time, and which in time of war has become most valuable for measuring values otherwise impossible to determine," he stated. "Prominent among these are measurements of the magnetic flux which everywhere surrounds us and which makes a magnet turn toward the north pole. To measure these lines of force tending to set the tiny magnet needle in a line toward the north pole has been necessary in many operations. Now we have a meter which is so accurate that a measurement can be made down to one line of force. This is the ultimate in such measurements."



We are always ready and willing to give you advice on the care and maintenance of your valves. But valve failures are not always due to lack of knowledge—or neglect.

In countless instances valves fail to perform as they should because they're not of correct design and material for the services in which they are installed.

By consulting **POWELL Engineering first** you can avoid these failures because *Powell performance is pre-determined*—by experts.



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Dependable Valves Since 1846

Cincinnati 22, Ohio



Fig. 559—Iron Body Bronze Mounted Swing Check Valve for 125 pounds W. S. P. at 450 F. Has flanged ends, bolted flanged cap and regrindable, renewable bronze seat and disc. Sizes 2" to 12", inclusive. Also available for 250 pounds W. S. P. in sizes from 2" to 10", inclusive.



Fig. 241—Iron Body Bronze Mounted Globe Valve for 125 pounds W. S. P. at 450 F. Has flanged ends, outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc. This type of valve is also available for 250 pounds W. S. P. Sizes 2" to 12", inclusive.



Fig. 1793—Iron Body Bronze Mounted Gate Valve for 125 pounds W. S. P. at 450 F (12" and smaller), 100 pounds W. S. P. (14" and larger). Has flanged ends, outside screw rising stem, bolted flanged yoke, bronze seat and taper wedge solid disc. Sizes 2" to 30", inclusive. Also available for 250 pounds W. S. P. in sizes 2" to 24", inclusive.

POWELL VALVES

The Best

— WITH A WORLD AT WAR



Our first duty in war is to equip our armed forces with the finest in Rainwear. Our next important job is keeping American Industry on the job with essential raincoats, rainsuits, shoes, and boots.

"U. S." Industrial Occupational Protective Clothing is the best you can buy today. It is made of synthetic rubber and the finest materials available by the same skilled workmen — 100% waterproof, with vulcanized seams.

WILDER RAINCOAT, HOOBY HAT, 4-BUCKLE ARCTICS

Below: SKIPPER SUIT, SQUAM HAT



Makers of "U.S." ROYAL
FOOTWEAR AND AMMO-CURE RAINSTERS

UNITED STATES RUBBER COMPANY

1230 Sixth Avenue • Rockefeller Center • New York 20, N. Y.

PLASTIC PROTECTIVE COATINGS

Prove Excellent Substitute for More
Critical Materials

NEW methods for controlling characteristics of plastics films used by the Army in protective coverings for equipment, subsistence and other supplies going out to armed forces in all parts of the world are being developed under a research program now under way by the National Research Council's Committee on Quartermaster Problems.

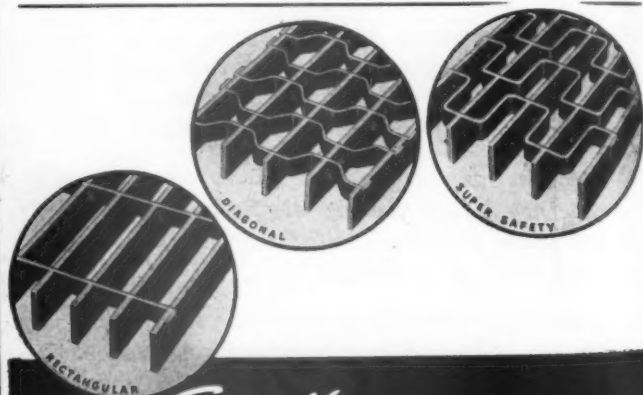
Although the program has been under way only a little more than a month, Quartermaster Corps technicians who are cooperating in the studies report that experiments with specific additives, that is, materials not ordinarily classed as plastics, impart to films qualities of moisture vapor resistance or other desirable characteristics, whereas the addition of other materials will eliminate certain undesirable characteristics.

The program seeks to develop methods whereby these characteristics may be controlled so that definite types of film for definite purposes may be planned upon, designed and manufactured. Another phase of the program will include research to see what new raw materials may be used in producing plastics film.

Fundamental research is being conducted at Brooklyn Polytechnic Institute, under the direction of Dr. Herman Mark of that institution, and test phases are being handled by the Washington Quartermaster Depot, Chemical Warfare Service Development Laboratory, National Bureau of Standards and R. H. Macy & Co., Bureau of Standards.

An advisory panel made up of technicians from companies in the plastics and allied industries engaged in

(Continued on page 312)



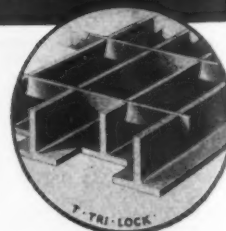
Specify
TRI-LOK

OPEN STEEL FLOORING • SAFETY STEPS
CONCRETE ARMORING T. TRI-LOK

DRAGO CORPORATION
300 PENN AVENUE, PITTSBURGH, PA.
REPRESENTATIVES IN PRINCIPAL CITIES



Full descriptive catalog
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Treads and other prod-
ucts on request.



THIS ONE IS REALLY SPECIAL!



Another example of
Taylor Forge "know-how"
that means extra value
in WeldELLS

• *They don't come much more special than this fitting:
Special material . . . carbon-moly. Special size . . . 9".
Special wall thickness . . . 0.542". Special design . . .
integrally formed 3" side outlet.*

But special though it is, it is simply typical of the problems that are so frequently put up to us by those who have found that we can solve them right.

Yes, doing the *unusual*: In our regular line of WeldELLS and other Taylor Forge welding fittings we have done the unusual. Into WeldELLS has gone the knowledge acquired in performing just about every conceivable kind of forging operation; knowledge of controlling hot metal under pressure and impact; knowledge that was full-grown long before welding fittings were ever produced on a commercial scale.

This is reflected in WeldELLS in features like extra metal properly distributed where stresses are greatest . . . in the tangents . . . in the extremely accurate dimensions . . . in the features, listed opposite, that are combined in no other welding fittings. Check over this list, and we believe you will agree that

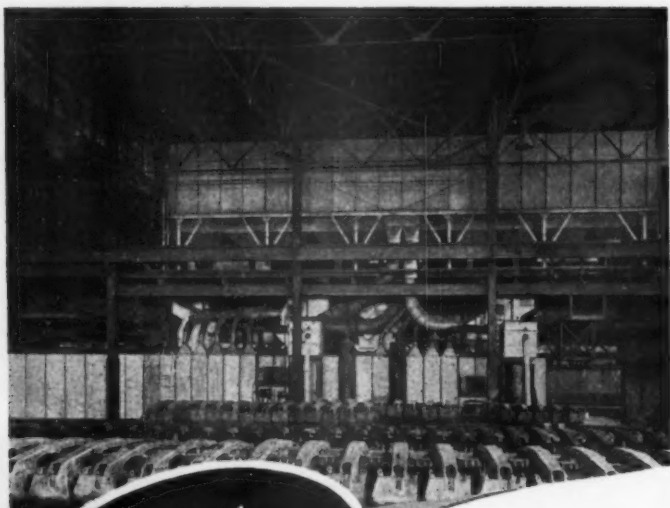
WeldELLS have everything

TAYLOR FORGE & PIPE WORKS, General Offices & Works: Chicago, P. O. Box 485
New York Office: 50 Church Street • Philadelphia Office: Broad Street Station Bldg.

WeldELLS alone combine these features:

- **Seamless**—greater strength and uniformity.
- **Tangents**—keep weld away from zone of highest stress—simplify lining up.
- **Precision quarter-marked ends**—simplify layout and help insure accuracy.
- **Selective reinforcement**—provides uniform strength.
- **Permanent and complete identification marking**—saves time and eliminates errors in shop and field.
- **Wall thickness never less than specification minimum**—assures full strength and long life.
- **Machine tool beveled ends**—provides best welding surface and accurate bevel and land.
- **The most complete line of Welding Fittings and Forged Steel Flanges in the World**—insures complete service and undivided responsibility.





*Don't be
Penny Wise and
Pound Foolish*

ELIMINATE DUST!

**Parsons
OVAL BAG
DUST ARRESTORS**

● Factory dust and dirt does more than any one single factor to slow up production, cause absenteeism, and deteriorate equipment and plant. This is a terrific penalty to pay for rampant dust which can be harnessed.

A clean plant is a profitable plant and Parsons Oval Bag Dust arrestors have for over a quarter of a century been mastering not only dust problems in all types of plants, but in many cases actually paying for themselves.

There are many reasons for Parsons Ovals popularity some of which are to be found in their advanced engineering features such as: patented Oval Filtering Bags, Non-Rusting Arrestor Case, Simple Texrope Drive, Heavy Duty Welded Hoppers and others.

Our engineers would be glad to discuss your problems with you. Just drop us a line, no obligation, or send in for free dust control bulletin "Mastery of The Air."

*Write for
OUR
BULLETIN
"MASTERY
OF
THE AIR"*

**PARSONS
ENGINEERING
COMPANY**
2545 EAST 79th ST.
CLEVELAND, O.

(Continued from page 310)

manufacture of synthetic resins and films is cooperating in the study.

Already numerous uses for plastic films have been developed by the Quartermaster Corps, applications in which they serve not only as substitutes for other, and more critical, materials, but in which they serve the purpose desired even more effectively than the material previously used.

Most of these uses are in the field of packaging and protective coverings. Outstanding among the latter group is the use of a vinyl plastic film envelope as a protective cover for the small arms of troops engaged in landing operations. Pliant, semi-transparent bags of this tough material not only shield rifles, carbines, pistols and machine guns from water, but sometimes aid the soldier himself in keeping afloat.

1 1 1

MUST CONSERVE RUBBER

**Supplies of Natural Rubber Steadily
Being Depleted**

THE Combined Raw Materials Board issued the following statement on the position of the United Nations in respect to supplies of natural rubber.

The considerable progress achieved in the American synthetic rubber program has led to a certain lack of appreciation concerning the United Nations' need for natural rubber. Since this misunderstanding threatens to hamper the United Nations in securing the largest possible amount of natural rubber from the few prod-

(Continued on page 314)

ORANGE CORE
Sealing Tape
"AMERICA'S MOST
POPULAR BRAND"

**THE TAPE
WORTH ASKING FOR**

Orange Core is your guarantee of top-most quality in speedy, tough and tenacious tape for your cartons. Keep it in mind even though it may sometimes be difficult to get all you need due to war-time conditions.

Moore & Thompson • Div. Hudson Pulp & Paper Corp. • 220 E. 42nd St., N. Y. C.



**Give him New Comfort
in eye protection
with the
NEW AO FUL-VUE
ACETATE GOGGLE**

This new acetate goggle—the result of two years' research in AO's Development Department—offers real comfort in eye protection.

It has a stronger, more massive front than ordinary acetate models. A deep groove in the lens rim forms a lens seat with substantial backing to resist severe impact. And the bridge has a slight amount of face form to give added side protection. Nose pads are also made of heavy stock and have well-rounded edges and an ample flare to withstand extraordinary jolts and blows.

Besides greater strength, this new goggle is designed for all-day comfort, too. The

light-weight acetate rests lightly on the face, while comfort cable temples hold the goggle snugly in position, prevent it from sliding forward on the nose. And the excellent fitting qualities of this goggle make it ideal for workers who need Super Armorplate lenses ground to their own prescriptions.

AO Ful-Vue Acetate Goggle No. F-8247 comes in 47 mm. eyesize in Pink Crystal with either white or Calobar 6-curve Super Armorplate impact-resisting lenses. It is available in three bridge sizes, 22, 24, and 26. Your nearest AO Representative can supply you. Call him today. And if you need acetate goggles for flash welders and those working around welding, ask him about the other new Ful-Vue Acetate Goggle that comes equipped with side shields and Calobar lenses.

American  Optical
COMPANY
SOUTHBRIDGE, MASSACHUSETTS

Manufacturers for more than 111 Years of products to Aid and Protect Vision. Branches in all principal industrial centers

**Here's a Dollar-and-cents
Message for every pump user!**

FREEDOM OIL COMPANY

ESTABLISHED 1878
REFINERS OF PENNSYLVANIA CRUDE

FREEDOM, PA.

November 1, 1943

Darling Valve & Manufacturing Company
Williamsport, Pennsylvania

Gentlemen:

Here's a performance report on Darcova Pumps taken from our maintenance records. It should interest you as much as it did us.

Equipment: Worthington duplex steam pump, 12 x 5 x 12 with cast iron insert liner.

Service: Crude oil unit charging, 250-275# pressure, atmospheric temperature, corrosive service.

Average previous performance using cast iron rings:

Rings - 15 days
Pistons - 30 days
Liners - 30 days to 60 days
Rods - varying lengths of time, 30 to 90

Performance using Darcova-designed pistons and Darcova Pumps:

Installed: September 4, 1942 along with
6" seamless steel liner, metal sprayed with
hard stainless steel I.D. ground finish.

Pistons and Pumps are still in service today, nearly 14 months later, with original liners, pistons, rods, and packing still operating. Pump efficiency increased over 25%.

Yours very truly,
Ross McClain
Ross McClain,
Master Mechanic

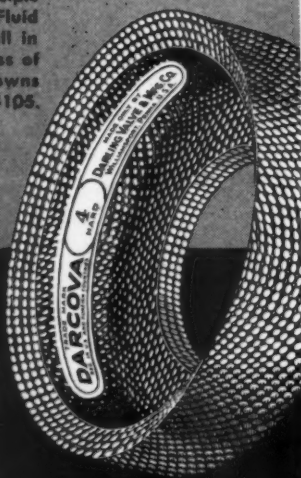
RM/EE

• For over forty years Darcova has been helping pump operators to save time and money and to set operating records like this.

With Darcova Pumps the cup principle insures constant pumping efficiency. Fluid pressure keeps the Pumpcup sidewall in close contact with the liner, regardless of wear. Efficiency is increased, shutdowns are fewer. Send for Bulletin No. 4105.



**DARLING VALVE &
MANUFACTURING
COMPANY**
WILLIAMSPORT, PA.



(Continued from page 312)

using areas still under our control, the Board wishes to emphasize in the strongest possible terms our urgent need for crude rubber.

Synthetic rubber has not dispensed with the need for natural rubber. All experience to date indicates that certain products such as surgical goods, truck and bus tires and a variety of essential war items still require varying percentages of natural rubber. Our small supplies of natural rubber are steadily being depleted as we continue to mix natural rubber with the synthetic product. Technical experts on both sides of the Atlantic have made large strides in learning how to use synthetic rubber in place of crude. It is essential that we continue our efforts to increase the proportions of synthetic rubber in tires and all other products in which some natural rubber still is being employed.

Very careful estimates have been made of the quantities and types of tires and rubber products required to be produced for military and essential civilian use during the coming year. The authorities in both the United Kingdom and the United States are reducing to the minimum the amount of natural rubber which the manufacturers will be permitted to use in meeting this program. Nevertheless, the amount of crude rubber which must be released if essential needs are to be met will dangerously deplete our natural rubber reserves and leave our stock position at the end of the year at below the minimum set in the Baruch report. The situation in 1945 will be further aggravated unless more natural rubber than is now in sight is forthcoming.

In other words, despite the great success to date with the synthetic program and the need for bringing it to

(Continued on page 316)

















**MATERIALS
HANDLING
EQUIPMENT**

**MATERIALS
PROCESSING
EQUIPMENT**

The handling equipment construction "know-how" of the Mercer Engineering Works, Inc., Clifton, N. J.... The more than 40 years processing equipment experience of Robinson Mfg. Co., Muncy, Pa. . . . All are embodied in and represented by

Trailer Trucks
Wheel Tractor Cranes
Hoisting Units
Elevators
Fork Lift Trucks
Conveyors
Carts & Tool Wagons
Truck Wheels
& Casters

Gyro Sifters
Sawtooth Crushers
Knife Cutters
Mixers
Attrition Mills
Hammer Mills
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Complete Installations

INQUIRIES INVITED

MERCER-ROBINSON COMPANY, INC.
30 CHURCH ST., NEW YORK 7, N. Y.

Making strong the things that make America strong



Holding a Ship's Shape . . .

Shaping a Stove's Course



THAT SHIP . . . defying a rough-and-tumble fighting ocean . . . needs stiff-willed stamina in the bolts and nuts that secure its ribs.

That stove . . . built on a fast-moving production schedule . . . needs bolts and nuts that are quick on the get-away and take tightening without fumbling or jamming.

For fastening strength that will resist whatever beating a ship or steam-shovel or stone-crusher can give . . . for accurate

mating that hurries a product along an assembly line: fasten with RB&W bolts and nuts.

RB&W developments in cold-forming and cold-punching have set new standards in holding power, accuracy and appearance for all kinds of fastening devices.

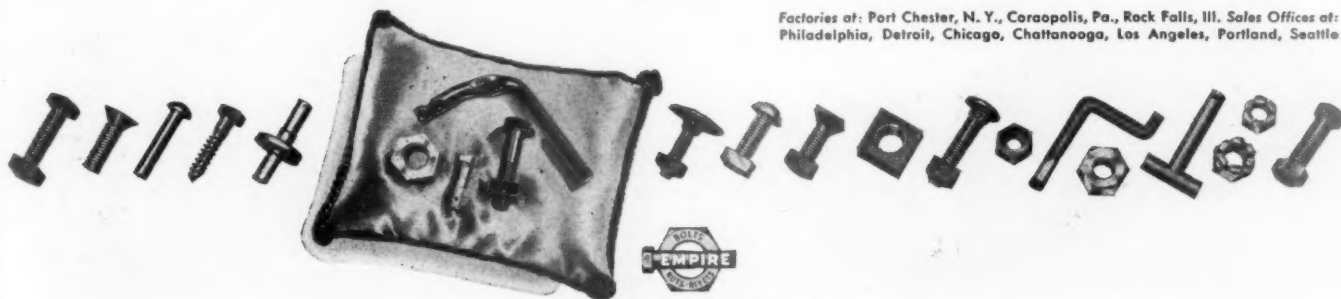
The dependability you would expect from the accumulated experience of 99 years and the results of hundreds of thousands of dollars' worth of research work . . . is wrapped up with every shipment

of RB&W products. Little wonder that so much of the best-known farm machinery, transportation equipment, electrical appliances, construction equipment and furniture is put together faster and held together better by RB&W fasteners.

RB&W

**RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY**

Factories at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill. Sales Offices at: Philadelphia, Detroit, Chicago, Chattanooga, Los Angeles, Portland, Seattle



AND ALLIED FASTENING DEVICES SINCE 1945

Tomorrow?

*Will free enterprise prevail?
Will there be religious tolerance or intolerance?
Will racial prejudices grow or disappear?
Will labor-management bog down before selfish-interest blocs?
Will commerce and industry be restricted or expanded into a world wide renaissance?*

The answer is in what each of us thinks and does. Do-nothing wailers will be with us always, but they are the small minority. The pioneering spirit that made America the envy of the world still runs strong in our veins. A new industrial era is already well under way in which thermostatics is carving a leading place in tomorrow's civilization.

*"One ship sails east, and another west,
By the selfsame winds that blow;
It isn't the gales, but the set of the sails
That determine which way we go".*

GITS
Molding Corporation
4640 WEST HURON ST., CHICAGO 44, ILLINOIS

(Continued from page 314)

maximum production at the earliest possible date, we are consuming natural rubber at a considerably greater rate than we are receiving it from the few sources still available to us. Even at the lowest rate to which we can compress natural rubber consumption, supply and requirements of natural rubber will not be in balance. It is, therefore, essential that the greatest possible economy in the use of natural rubber continue to be maintained and that every step be taken to increase the amount of natural rubber available to the United Nations.

1 1 1

PAINT CHALKING

Moderate Chalking Not a Defect

LIKE any material which serves its purpose by slowly wearing away its substance, paint ages in a manner characteristic of its composition. Good paint wears away slowly by the process known as "chalking" while poor paint may wash off rapidly or it may crack and scale off in flakes leaving a rough unsightly surface. The property of slow even wear with slight chalking is one of the well known characteristics of pure white lead paint. Its occurrence is indicated by the presence on the surface of a fine white powder which shows up when a dark cloth or the hand is rubbed across the surface.

The reason for the presence of this powder, which begins to show up about a year after painting, lies in the nature of the paint materials and their action on one

(Continued on page 318)



- Keep a Bunting Catalog handy. Often it affords a quick, easy solution to your need for completely finished Bronze Bearings and factory-finished Bearing Bronze Bars. A copy will be sent promptly on request... The Bunting Brass & Bronze Company, Toledo, Ohio. Warehouses in Principal Cities.

★ ★ WAGNER PRODUCTS FOR VICTORY ★ ★

Wagner Unit Substations
are doing their part in
the production of steel,
synthetic rubber, oil and
other vital materials.

Wagner

UNIT SUBSTATIONS

PROVIDE LOAD CENTER CONTROL FOR
LIGHTING AND POWER CIRCUITS

The Unit illustrated above is installed in a synthetic rubber plant. Each transformer has a two-position liquid-filled disconnecting switch on the high-voltage side which is equipped with low-voltage interlock. The low-voltage side is equipped with air circuit breakers electrically or manually operated, ground indication lights, voltmeters, ammeters, and ammeter test blocks. Each unit has one main breaker, one tie transfer breaker, and two feeder breakers.

MOTORS
TRANSFORMERS
UNIT SUBSTATIONS
INDUSTRIAL BRAKES
BRAKE LINING



For Complete Information on Wagner Unit Substations write or phone the nearest Wagner branch office.

**BACK THE ATTACK—
BUY U. S. WAR BONDS**



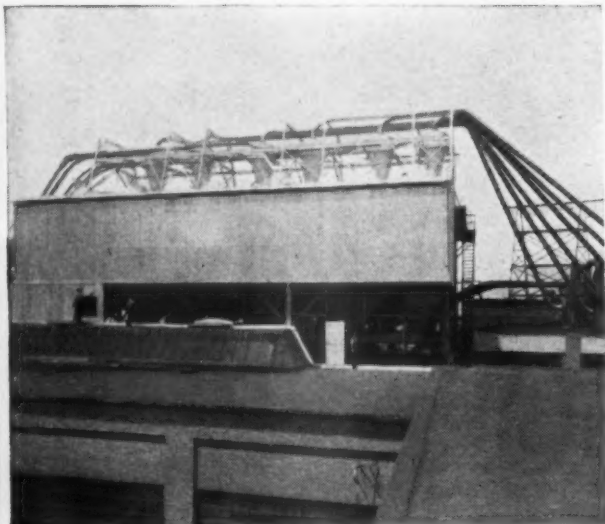
T44-3A

Wagner Electric Corporation

ESTABLISHED 1891

6360 Plymouth Avenue, St. Louis 14, Mo., U. S. A.
ELECTRICAL AND AUTOMOTIVE PRODUCTS

CORK STORAGE BINS, 18 hoppers of No. 10 ga. steel, kept weatherproof by a 54' x 81' x 30' corrugated enclosure . . . System, including structural supports and conveyor ducts designed, fabricated and erected by Brandt.



**Big Installations
or Small Parts—**

Call

BRANDT of Baltimore

*for Precision in Heavy Plate
and Sheet Steel Work*

Here is an 8½ acre plant . . . with the most modern equipment for shearing, rolling, forming, welding and completely fabricating ferrous, non-ferrous and alloy metals to your specifications . . . from the lightest gauge up to and including 1¼" mild steel or ¾" armor plate. Extensive war contracts necessarily limit our present acceptance of new business for immediate delivery. Charles T. Brandt, Inc., Baltimore-30, Maryland.



BRANDT of Baltimore—Craftsmen in Metal Since 1890

(Continued from page 316)

another. White lead and linseed oil are used to make paint because they are chemically interactive. They not only mix together but they actually unite. When the paint is spread out upon a surface the linseed oil dries, or more correctly solidifies by reason of the absorption of oxygen from the air, forming a tenacious film which is tough and elastic and has a measurable thickness. Since the white lead will not decompose or dissolve, this film can wear away only as the oil disintegrates. And, since the oil is actually compounded with the white lead, the rate of breakdown is very slow. However, some destruction of the organic matter of the oil does take place releasing the particles of white lead on the surface, thus producing the "chalk" or white dust that can be rubbed off slightly.

It is an easy matter to add other ingredients to white lead paint to retard or even prevent chalking. However, such additions tend to produce a brittle inelastic paint which is inclined to crack as a result of expansion and contraction of the material to which it is applied. When cracks occur the paint can no longer perform the function of keeping water away from the underlying material.

Advantages of Chalking

Thus it can be seen that moderate chalking is not a defect of paint. It is a good indication that the paint is soft and elastic enough to expand with the base material. Actually chalking has several advantages. Not only does it result in self cleaning by releasing collected dust and dirt along with the surface particles of lead but it gradually decreases the thickness of the paint film so that subsequent repaintings will not build up a coating too heavy to adhere to the construction.

WANTED!

**THE NAMES OF FIRMS
NEEDING PRODUCTS PROCESSED
FROM CANVAS OR DUCK**

If your company needs—or will need—anything made from canvas, let us know NOW. The supply allotted to us for civilian requirements, after we are finished with present government contracts, may not be sufficient to supply "everything in canvas" that we normally produce. We shall have to concentrate on those items for which there IS THE GREATEST DEMAND.

THE REWARD

Those purchasing agents who list with us now their canvas items most needed will be the ones to receive FIRST consideration when we are able to accept and make up orders.

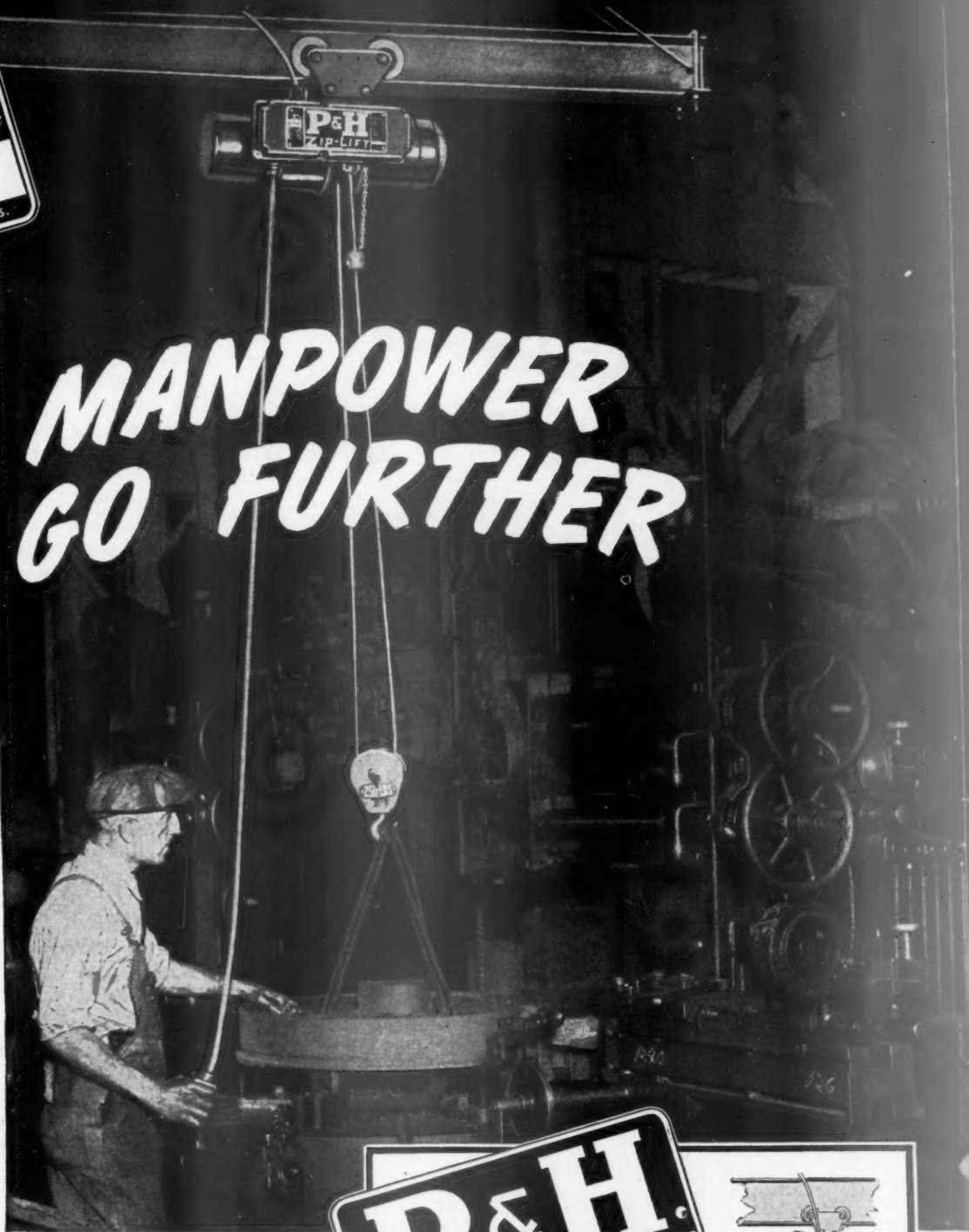
FOSTER MANUFACTURING CO.

430 NOTRE DAME ST., NEW ORLEANS-6-LA.



MAKE

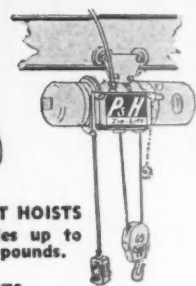
**MANPOWER
GO FURTHER**



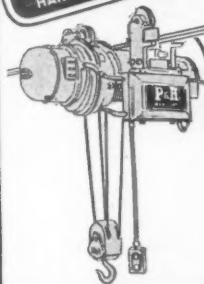
For conserving vital manpower . . . for saving energy . . . for speeding up the handling of materials . . . and for eliminating aisle congestion . . . P&H Zip-Lift Hoists provide the quick, easy answer.

These modern electric hoists can be installed anywhere — quickly. With simple, full magnetic push button you have safe control — lifting, moving and lowering is fast and effortless. Zip-Lifts pay for themselves on an average of twice a year.

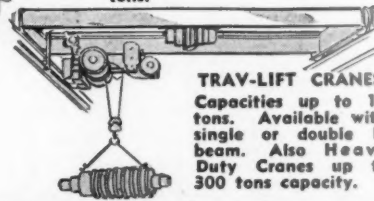
See how P&H Hoists can give you greater production today — and how they will aid you in lower cost production tomorrow. Call in a P&H Hoist Engineer. There is no obligation. Or if you wish, send for a copy of Bulletin H20-1.



ZIP-LIFT HOISTS
Capacities up to
2,000 pounds.



HEVI-LIFT HOISTS
Capacities up to 15
tons.



TRAV-LIFT CRANES
Capacities up to 15
tons. Available with
single or double I-
beam. Also Heavy
Duty Cranes up to
300 tons capacity.

General Offices:

4577 W. National Avenue, Milwaukee 14, Wisconsin



Now you can fasten V-belts
by using

ALLIGATOR
V-BELT FASTENERS



● Alligator V-belt Fasteners and the open-end V-belt now being made by belting manufacturers, will enable you to make up multiple V-belt drives from roll belting. These fasteners have been on the market 9 years and are now being used on a wide variety of drives.

Available for B, C, D sizes of belt for industrial use and 1-in. and 2-in. sizes for railroad use. These fasteners, however, should not be used for repairing endless cord V-belts.

Bulletin V-205 will give you complete details as to where and how these fasteners are used, sizes, list prices, tools and application instructions. A copy will be mailed at your request.

Order from your supply house

FLEXIBLE STEEL LACING COMPANY
4697 Lexington Street, Chicago 44, Illinois

Also sole manufacturers of Alligator Steel Belt Lacing for flat transmission belts and Flexco HD Belt Fasteners and Rip Plates for fastening and repairing conveyor belts.

WPB FORM 1319 REPLACES 20 DIFFERENT FORMS

REGULATIONS of the War Production Board designate the Government Division as responsible for the first consideration of all WPB applications received in Washington from all agencies of government, schools, colleges, hospitals, eleemosynary institutions or organizations such as Red Cross, U.S.O., Boy Scouts, and all other organizations or institutions, public or private, as defined in CMP Regulation 5A.

Effective immediately, all such agencies and institutions should use the revised standardized WPB Form 1319. At this writing, this form has replaced 20 different forms which covered 52 separate items of equipment, and additional forms may be replaced by 1319 in the future. As a result of the War Production Board's desire to reduce the number of forms and the amount of paper work involved, this standardized form has been adopted.

It is to the distinct advantage of the applicant to begin immediately to insert in Block 6 of this Form the words "Government Division". This insertion may be made as follows:

6. WPB Order No. (See Instructions)
L-- -- "Government Division"

Applications so identified will be sent promptly to the Government Division for processing. This Division will be able to serve its applicants more promptly than if these forms are received in Washington without the identification suggested.

THE CENTRAL
Certified Accuracy
MICROMETER

Immediate Delivery

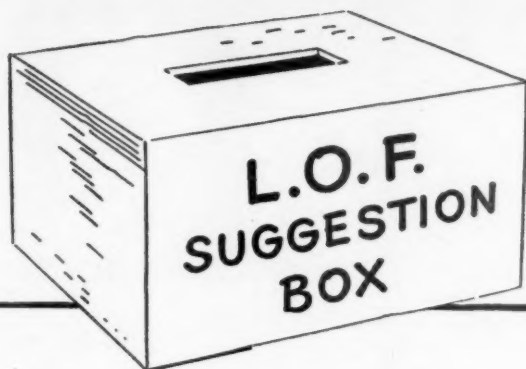
All sizes from one inch to six inches available for immediate delivery from stock.

Central Certified Accuracy Micrometers May Be Purchased singly or in de luxe sets. Write for illustrated catalog.

THE CENTRAL TOOL CO.

MICROMETERS OF CERTIFIED ACCURACY
AUBURN . . . RHODE ISLAND



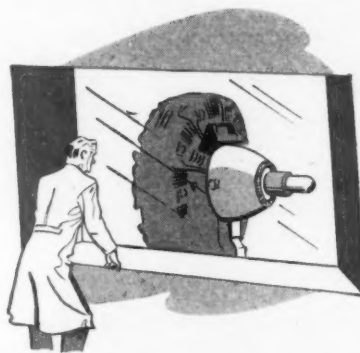


... more ways
industry is getting things done better
... with *Glass*



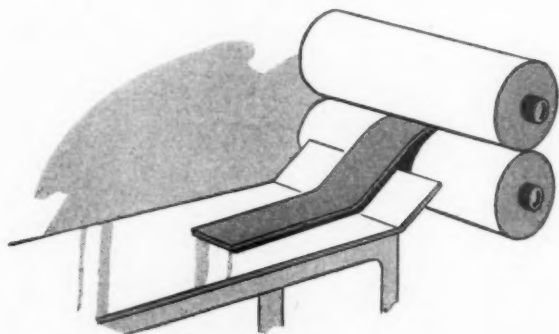
Glass DRAFTING BOARD

In a Florida shipbuilding plant, Libbey-Owens-Ford Vitrolite, made with special sandblasted finish, is being used as the surface for making detail drawings. Why? For accuracy. Glass surfaces are hard, smooth and flat, easily cleaned. Also, because glass is less affected by temperature and humidity.



Glass FOR TESTING CHAMBERS

Use L-O-F THERMOPANE, the patented glass insulating unit, for windows of temperature testing rooms. Made of two or more panes of glass bonded together with hermetically-sealed air space in between, THERMOPANE provides clear, transparent insulation under extreme temperatures.

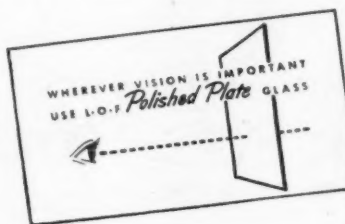


Glass RUN-OUT TABLES

Because plate glass can be made flatter than most materials, it is used for run-out tables for plastics, leather goods and fabrics. Glass is unaffected by moisture or chemicals commonly used . . . and most materials easily pass over its surface without sticking.

GLASS has many other properties important to the user or designer of industrial equipment. It has one of the hardest surfaces known. Nonporous—it will not absorb liquids or odors. It successfully resists almost all acids and alkalis. Glass has a higher tensile strength than some metals. It cleans easily, thoroughly.

If these properties of glass suggest uses to you—let's talk it over. We may come up with just the answer you are looking for. Libbey-Owens-Ford Glass Co., 5944 Nicholas Bldg., Toledo 3, Ohio.



LIBBEY • OWENS • FORD

A GREAT NAME IN *Glass*

TOPS!

for serviceability . . . in shop, plant or mill

HOLLOWELL

SHOP EQUIPMENT

"Hallowell" Work-Benches of Steel have long been famous for their extraordinary sturdiness and adaptability. Of rigid construction, they set firm without costly bolting to the floor—are easily moved. Made in 1367 interchangeable combinations to meet practically any requirement. Deliveries are now being made quite promptly, so send for the "Hallowell" catalog and get the benches you need without delay.

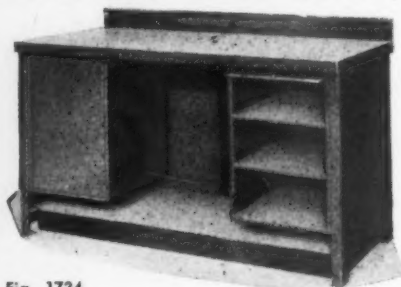


Fig. 1734



Fig. 928.
Pat'd and Pats. Pend.
Drawer is extra.

"HALLOWELL" DE LUXE SHOP FURNITURE FOR POST-WAR USE

Designed to better meet specific functional needs of modern industry, "Hallowell" De Luxe Shop Furniture will be available shortly after the war. Bench shown has back-board, lower shelf and two receding door cabinets—one unit open.

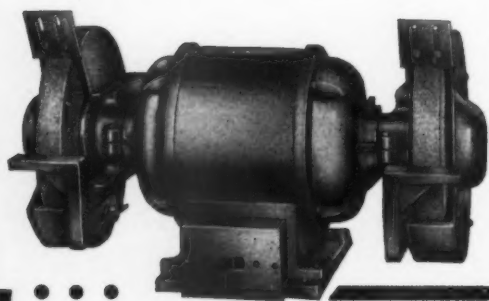
Over 40 Years in Business

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA., BOX 602

BRANCHES: BOSTON • DETROIT • INDIANAPOLIS • CHICAGO • ST. LOUIS • SAN FRANCISCO

Valley Heavy Duty GRINDERS Ball Bearing MOTORS



VICTORY on the production front is being aided mightily by the economical and faithful service of thousands of Valley motors and grinders in war plants everywhere.

Prompt delivery of Valley Equipment can be obtained by those authorized to purchase.

Valley Ball-Bearing Motors from 1/2 h.p. to 75 h.p. . . Grinders from 1/4 h.p. bench type to 5 h.p. pedestal models.

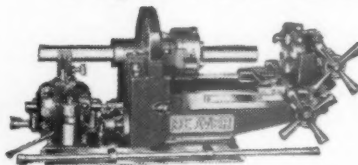


VALLEY ELECTRIC CORP.

4221 Forest Park Blvd.

St. Louis, Missouri

The A-B-C of Pipe and Bolt Machines

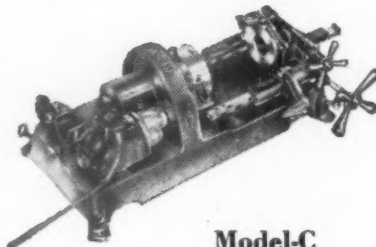


Model-A

A high-speed heavy-duty deluxe Pipe and Bolt Machine. Range 1/4 to 2-inch—up to 12-inch with geared tools and drive shaft. Bolts, 1/4 to 2-inch. Wt. 415 lbs. Ask for Bulletin-A.

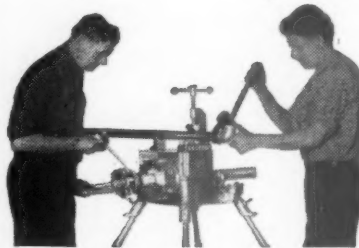
Model-B

A compact utility Pipe and Bolt Machine combining many features of Model-A with the easy portability of Model-C. Range 1/4 to 2-inch—up to 8-inch with drive shaft and geared tools. Bolts up to 1 1/2-inch. Weight 280 lbs. Ask for Bulletin-B.



Model-C

A sturdy little Power Unit Converts Hand Pipe Tools into Power Tools from 1/4 to 8-inches. Threads 8-inch in 6 minutes. Threads bolts up to 1 1/4-inch. Equipped with automatic chuck wrench ejector—a safety feature. Two men can use it at the same time without interference. Easily portable—weighs about 150 lbs. Write for Bulletin-C.



Also a complete line of hand tools.

BEAVER PIPE TOOLS

444 GROW AVE., WARREN, O.

SERVE RIVETS IN CELLOPHANE

Stay Cold Longer—Resorting Time and Wastage Materially Reduced

ICE-COLD rivets in cellophane bags are a favorite "dish" for aircraft workers, who have them served from portable freezer cabinets resembling the familiar ice-cream wagon. This war-time application of the familiar transparent film is saving bomber manufacturers time and money formerly wasted in re-sorting, re-heating and re-cooling aluminum alloy rivets that had become too warm to be used.

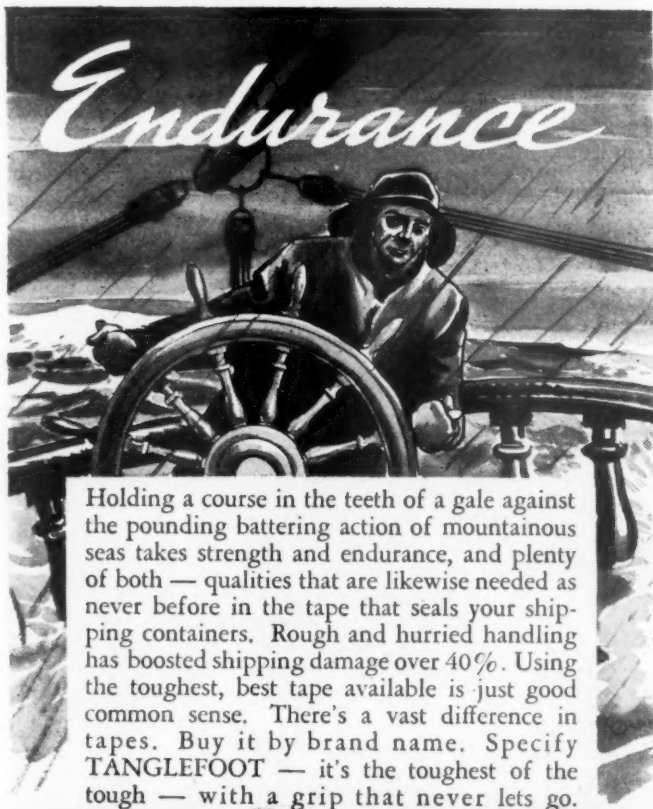
For, unlike steel rivets, which must be hammered while they are hot, aluminum rivets must be driven while they're very cold. They are first heat-treated at above 900 degrees Fahrenheit, and then quenched in oil or water, following which they are further chilled to about 45 degrees below zero in a freezing machine.

In this cold state they are quite malleable and can be easily driven. As they warm to room temperature, an "aging" process takes place which increases the strength of the metal far beyond that existing before heat-treatment, but makes them too brittle to drive easily.

Under ordinary methods of handling, most airplane rivets have to be driven within a half hour after they are removed from the freezer compartment. Those unused in this time are tossed into a box, with many other sizes, and all have to be re-sorted and then given another heat-treatment.

The use of bags made of cellophane affords enough insulation so that rivets taken out of the freezer cabinet but left in the cellophane envelope can be used as long

(Continued on page 324)



Holding a course in the teeth of a gale against the pounding battering action of mountainous seas takes strength and endurance, and plenty of both — qualities that are likewise needed as never before in the tape that seals your shipping containers. Rough and hurried handling has boosted shipping damage over 40%. Using the toughest, best tape available is just good common sense. There's a vast difference in tapes. Buy it by brand name. Specify **TANGLEFOOT** — it's the toughest of the tough — with a grip that never lets go.

TANGLEFOOT Gummed Tape

THE TANGLEFOOT CO., Grand Rapids, Mich.

BECAUSE OF THIS...



A PLANT WAS LOST

A pile of oily, grimy rags thrown carelessly in a corner starts smoldering . . . and before you realize it . . . "here lies the remains of So-and-So's plant" . . . you know the story well.

This needless waste *can* be prevented. Equip your plant so safety is *easy* for even careless employees. Equip your plant with Justrite Safety Products . . . Oily Waste Cans, Safety Cans and Safety Filling Cans.

The Oily Waste Can is the safe receptacle for oily, dirty, dangerous waste. The Safety Can provides a safe means of storing and handling touchy liquids. The Justrite Safety Filling Can has long flexible metal pouring spout and separate filler opening. It's absolutely safe for handling and pouring flammable liquids.



Safety Can



Oily Waste Can



Safety Filling Can

These Justrite Safety Products are approved for safety by Underwriters' Laboratories, Inc. and by the Associated Factories Mutual Fire Insurance Companies.

Play safe with safety . . . Justrite.

JUSTRITE MANUFACTURING COMPANY
2063 North Southport Ave., Dept. B-2, Chicago, Ill.

JUSTRITE *Safety Products*
SAFETY CANS · FILLING CANS · OILY WASTE CANS
APPROVED SAFETY ELECTRIC LANTERNS

**THE MATERIAL— SYNTHETIC
RUBBER
THE MEDIUM—
Brightboy**



Rubber gives RESILIENCY—relative softness that controls and “cushions”. Rubber-cushioned BRIGHT-BOY applies this resiliency—combines rubber and abrasive—for close-tolerance.

**DE-BURRING ★ FINISHING
POLISHING**

saving countless operations

Ask your dealer for prices and Applications Data. Ask Brightboy field representatives or our Service Department about saving time—improving quality—in your abrasive finishing.

BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO. Newark 7, N. J.

WELDON

ROBERTS

B r i g h t b o y

**There is no Worthwhile Substitute
For Correctly Built WHEELS**

Whatever your materials handling jobs — or the wheeled equipment you produce — WHEELS are IMPORTANT. If you want free-rolling under heavy loads — if you want to protect expensive floors — if you want quiet operation —

**SPOKE
CAST
and
PRESSED
WHEELS
for
INDUSTRY
with
or without
RUBBER
TIRES**

if you want full-cushioned shock absorption to protect fragiles — if you want your wheel bearings protected against abrasive grits — there is a French & Hecht type of wheel exactly suited to your needs.

For TODAY and for your POST WAR effort of producing more and better goods at less cost, the 55 years of wheel building KNOW HOW we offer you can be converted into a profitable asset.

French & Hecht engineers will gladly submit recommendations on your particular materials handling problem — or the proper wheeling of conveyances or portable equipment you are now producing — or are designing for future markets. Our facilities enable us to design and test the wheels you require — and then produce them in volume, on schedule, at attractive prices.

Complete Information on Request



FRENCH & HECHT, INC.
A SUBSIDIARY OF KELSEY-HAYES WHEEL CO.

DAVENPORT, IOWA, U. S. A.
WHEEL BUILDERS SINCE 1888

(Continued from page 323)

as an hour or an hour and a half later—an increase of 100 to 200 per cent in their drivable life.

Furthermore, since the bags contain rivets of the same size, the returns are less likely to become mixed, and time necessary for re-sorting is reduced. One plant reports that whereas 15,600 pounds of rivets had to be re-sorted each month, the use of cellophane bags has cut this figure to 600 pounds, with an accompanying reduction in waste from 50 per cent to one and a half per cent. This saved the plant \$7,500 per month in addition to eliminating much of the expensive re-heat-ing and re-cooling.

**TITANIUM DIOXIDE—WHAT IT
IS, WHAT IT DOES**

FROM one of the blackest of black substances, ilmenite, by elaborate chemical processes comes the whitest of whites.

It is the ninth commonest element in the earth's crust. Between breakfast and bedtime everyone is sure to handle an object containing this substance—which is titanium.

Titanium dioxide is a white powder, so fine that it would take 16 million individual particles of it side by side to reach one inch.

It is used by the armed forces in the protective creams that safeguard skin against painful flashburns inside gun turrets, and in other creams that offer protection against sunburn and insects in the tropics.

This same titanium dioxide, as an ingredient of the coating for welding rods, assists in maintaining a steadier arc and in improving the weld.

It is titanium dioxide which gives present-day white paints their extraordinary whiteness and hiding power, and the lighter colors their clarity, and resistance to fading.

Many peacetime products such as white rubber and the best white leather depend for their whiteness on titanium dioxide. White buckskin, for example, is pigmented in the tanning operation with titanium which is so fine the particles go all the way through.

Linoleum and felt-base floor coverings owe much of their resiliency and long wear to this compound. It reaches the consumer in coated fabrics, even in soap.

Titanium dioxide is handling a job in the field of paper manufacture that effects all of us at the present time. Wartime needs for paper are so great that the

(Continued on page 326)

KRON
Dial Scales
FOR INDUSTRY'S EVERY NEED

THE KRON CO.
BRIDGEPORT CONN.



Ball AND Roller BEARINGS

There are standard **CJB** Ahlberg Ball Bearings and Bower Roller Bearings for most applications. Whether you are building new equipment or modernizing present equipment, **CJB** AHLBERG Ball Bearings and BOWER Tapered Roller Bearings will do the job efficiently, economically and satisfactorily.

AHLBERG BEARING COMPANY
Manufacturers of CJB Master Ball Bearings
★ 3039 WEST 47th STREET • CHICAGO, ILL. • ★

Available — IMMEDIATE DELIVERY

THE **Fibrecan MASTER**

Utility Wheel-can No. C150-V

HEAVY DUTY UTILITY Cans

Utility Can No. C110-V

Two models as illustrated . . . "Wheel-can" and "Stationary"

Skillfully designed and ruggedly constructed to withstand the roughest abuse. For use in all plants, warehouses, department stores and institutions. Made from extra heavy hardened fibre, crack and dent resisting. Reinforced steel top, and six inch fibre kick plate at bottom. Handsomely finished in Brown or Olive Green. Write for literature.

Fibrecan CORP. Dept. FSL
WHITESTONE (LONG ISLAND), N.Y.

"The Recognized Standard the World Over"

Safe Packing — First Step in PERFECT SHIPPING to . . .

The last step in war production—the one that determines the value of all the labor that has gone before—is the *safe packing* of materials for delivery. Damage in transit wastes ALL that has been put into a shipment—and must be prevented.

This month the men and women of production renew their vow to the fighting front—"we will make the best . . . deliver it in the best condition."

This month accents Signode Steel Strapping Company's year-round job of giving production the best in shipping safety, and service.



Call on your nearby Signode representative at any time—to assist you on any shipping problem.

PROTECT AMERICA'S PRODUCTION



The poster for Perfect Shipping Month—April, 1944

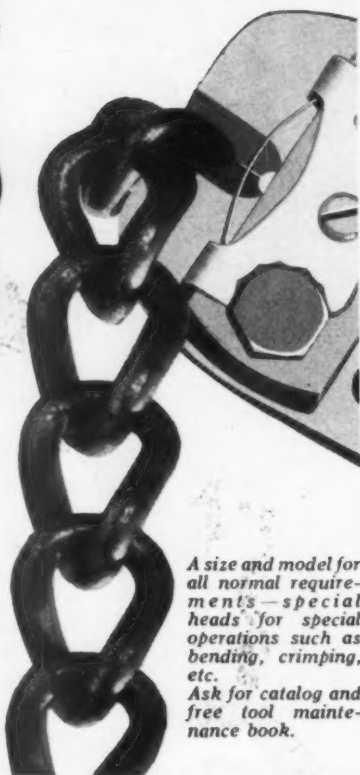
SIGNODE

Steel Strapping Company

2602 N. Western Avenue, Chicago 47, Illinois
Brooklyn, N. Y.: 371 Furman St. San Francisco, Calif.: 454 Bryant St.
Signode Steel Strapping Meets All Federal Strapping Specifications

CUTS CHAIN

When every power source fails — wreck, collapse, breakdown, etc., Porter Cutters keep right on working. They need no power except the two hands of the operator and they multiply that hand power approximately 80 times. Enough pressure at the head to cut $\frac{3}{4}$ " annealed bolts in the thread. Cuts rods, cable, chain (hard or soft), etc. They go with the man to the job, no matter where it is. Cutting is done in one quick handle movement. They stand up in long hard service.



A size and model for all normal requirements — special heads for special operations such as bending, crimping, etc. Ask for catalog and free tool maintenance book.

H. K. PORTER, INC., EVERETT 49, MASS.



*Production Line
efficiency in*
CANVAS GOODS

● We are in a position to create or duplicate items of canvas combined with metal, leather, wood or plastics; and to produce in volume at low cost.

WATERHOUSE COMPANY
WEBSTER, MASS.

(Continued from page 324)

Government asks for waste paper as salvage. Books and magazines are printed on thinner paper. Even the writing paper you buy today is thinner.

A few years ago it would have been difficult or impossible to use such thin paper, because the print or writing would have "shown through" from the back. But titanium dioxide, added to paper, keeps this from happening and so conserves paper—makes it go further.

1 1 1

COLOR POSTERS AVAILABLE ON SAVING CONTAINERS

SHIPPERS are urged to reduce to a minimum the amount of glue or silicate of soda used in sealing fibre containers in order to facilitate opening without causing excessive damage to the liners. One large soap manufacturer is now sealing all its fibre containers in this way, making it easier to open the cases. This company has printed the following message on all its paper containers, "This Case is Reusable. Open Both Ends Carefully. Save for Reuse."

A number of other shippers of large quantities of cartons now use gummed tape instead of sealing with glue. The tape may be readily ripped off without damage to the liner of the carton, it was pointed out.

Reports from five regional meetings with container users indicate fine cooperation from several industries and a tremendous saving in the various types of containers for reuse.

Colored posters urging the saving and reuse of steel drums are available to applicants who write the Containers Division for copies to be used as displays in their plants or for distribution to their customers.

Packers and distributors who have not yet secured their copies of the new WPB Broadside covering the Container Reuse Program should write to Frank J. Hynes, Room 2031 Temporary S, Washington, D. C. This document, in the form of a single sheet which may be used as a poster, explains, why maximum container reuse is necessary, methods of saving containers and how to keep them in circulation. Illustrations indicate methods of sealing and opening boxes and cartons to prevent damage and insure reuse.

1 1 1

ELECTROPLATING PROCESS MAKES HUGE TIN SAVINGS

ARIBBON of steel swirls through a maze of machinery and chemical baths at 1000 feet a minute, emerging with a shining coat of bright tin in a new, continuous electroplating process that is aiding the tin plate industry by producing material for cans many times faster than older methods permitted.

It is estimated that the yearly savings of tin resulting from the use of this process would total 1,200,000 pounds.

Known as the Halogen Tin Process and developed by the Electroplating Division of E. I. du Pont de Nemours & Company, this is one of the latest contributions of industrial science toward "better means for quicker victory." It speeds up production of the tin plate so essential for the manufacture of food containers.

The new electroplating method, one of the largest installations of which is now operating at the Weirton Steel Company, Weirton, W. Va., has other significant

(Continued on page 333)

THOMAS TRUCK of Keokuk



THOMAS MAKES



4 WHEEL TRUCKS



2 WHEEL TRUCKS



CASTERS



RUBBER WHEELS

WAGON TRUCKS

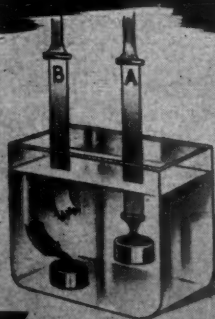
- Ball bearing steel 5th wheel.
- Steel angle 5th wheel supports.
- Safety tongue will not drop.
- Deck: Smooth seasoned 1" hardwood.
- Superstructures removable or locked.
- Wheels: Molded-on rubber or semi-steel.

The series 2400 Thomas wagon truck, pictured above with type E superstructure. Corner pockets for steel tube stakes are standard. They serve as an interlocking device to assure lasting rigidity and strength. Series 2400 is made in 10 platform sizes and 10 capacities. Catalog No. 43 gives full description.

THOMAS TRUCK & CASTER CO.

431 Mississippi River, Keokuk, Iowa

PAPERS FOR INDUSTRY



TESTED! PROVEN! WET STRENGTH PAPERS

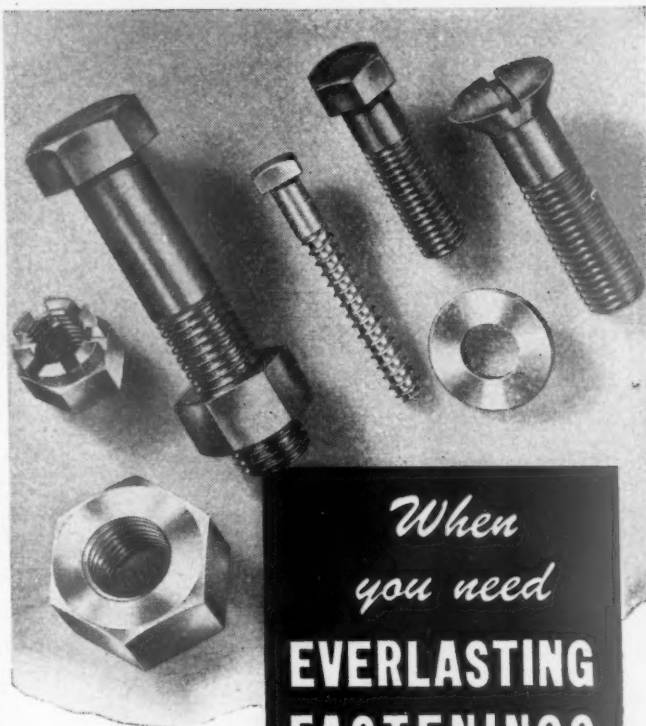
The above test tells the story of Wet-Strength papers. Treated paper "A" stood up for hours — untreated paper "B" broke in a few seconds. If you need a paper that will not disintegrate when wet, a Wet-Strength paper is your answer.

Central Paper Company is a pioneer in building "Papers For Industry."



CENTRAL PAPER COMPANY INC.

2441 Lakeshore Drive, Muskegon, Mich.



*When
you need*
**EVERLASTING
FASTENINGS**

ALL ROADS LEAD TO HARPER

When you need fastenings that (1) resist rust and corrosion . . . (2) are non-magnetic . . . (3) are practically non-sparking . . . (4) are usable again and again . . . your road leads to Harper's.

The Harper organization is known as "Headquarters for Non-Ferrous and Stainless Fastenings" because it specializes on these products . . . makes nothing of common steel. Harper stocks 4280 different items . . . operates hundreds of modern machines especially planned for the man-

ufacture of fastenings . . . maintains a large staff of field service engineers. New, colorful 1944 catalog and reference book will be ready soon.

BRASS
BRONZE
COPPER
EVERDUR
MONEL
STAINLESS

THE H. M. HARPER COMPANY
2606 Fletcher Street, Chicago 18, Ill.

BRANCH OFFICES:
New York City • Philadelphia • Los Angeles
Milwaukee • Cincinnati • Houston
Representatives in Principal Cities

HARPER

EVERLASTING FASTENINGS



Dependable!

Industrial Buyers Find Their Needs
Quickly and Easily with

PLANT-PRODUCTION DIRECTORY

Dependable as a lighthouse in a surging sea—**PLANT-PRODUCTION DIRECTORY** is an enlightening beacon to guide industrial buyers everywhere to reliable, straight-to-the-source-of-supply buying information. Because **PLANT-PRODUCTION DIRECTORY**, with no duplicate listings and no useless classifications, is basically designed to save time . . . and because it IS "tailor-made" to meet the specific requirements of busy industrial executives, you'll find it's truly a valuable guide to the most complete . . . *most accurate* buying information available today on plant equipment products or supplies for production and maintenance requirements.

Don't be misguided by bulkier books, but follow the Plant-Production Directory's simple, *streamlined* route direct to all desired buying information. Use it once—and you'll use it always. **PLANT-PRODUCTION DIRECTORY** is NOW available in your office!



Quick



Accurate

A CONOVER-MAST PUBLICATION

PLANT-PRODUCTION DIRECTORY, 333 NORTH MICHIGAN AVENUE, CHICAGO 1, ILLINOIS

SAVE TIME, WEIGHT, METAL,
MONEY AND LABOR WITH
MEYERCORD
DECALS

Meyercord Decals are serving the war effort in a thousand different ways . . . saving metal . . . money . . . weight . . . and man-power. Decal nameplates, instructions, inspection data, serial numbers, dial faces, insignia, etc., are used on tanks, combat and merchant ships, planes and communication equipment. They're durable, washable, and can be reproduced in any color, size or design. No screws, bolts or rivets required for application. No sharp edges. Meyercord Decals can be applied to flat convex or concave surfaces . . . for interior or exterior use . . . on metal, wood, fabric, rubber . . . even CRINKLED METAL! Special mar-proof Decals are resistant to temperature extremes, fumes, abrasion, vibration. Free designing and technical service. For complete information address Dept. 710.

THE MEYERCORD CO.

World's Leading Decalcomania Manufacturer

61-4 West Lake Street • Chicago 44, Illinois

WARNING
TURRET WILL NOT OPERATE
UNLESS SAFETY SWITCHES ARE ON

A WASTEFUL BROADSIDE *from your company*

CAN CRIMP A NAVY BROADSIDE

Against the Japs

YOU BET IT CAN. For the ammunition which our fleet fires reaches its destination protected by paper. And the paper you waste in an ornate, unnecessarily large advertising broadside is just what the Navy and the Army need to do their job.

That's why Uncle Sam asks you to watch every company project in terms of USING LESS PAPER. Whether it's a direct mail piece or a letter or a paper-board container—think of it as a challenge to you and to your colleagues. Yes, a challenge to you to see how you can carry on your

business and at the same time cut down and cut down and cut down on your company's use of paper.

Remember the whole country is being enlisted in this drive. You'll be a soldier in a mighty army of paper conservers.

And remember, right now, there's no home-front conservation job any more urgent or important than the conservation of paper and paper board.

If your company or your community has not yet organized Paper Conservation Committees, why not start them yourself and now?

Use Less Paper Because

Each 500-pound bomb takes 12 pounds of paper for rings, tops and bottoms.

A fiber container for a 75-millimeter shell takes 1.8 pounds of paper board.

Each weapon part must be wrapped in grease-proof paper and in waterproof paper. A single shipping case of decontaminating apparatus requires 273 square feet of waterproof lining paper.

All kinds of paper are used by the Army, from vegetable parchment, .0015 inches thick, to heavy paper board and wallboard.

Use Less Paper These Ways

Use smaller type sizes and margins. (Any competent printer, in consultation, can point the way to pronounced savings by these means.)

Reduce separators to shoulder height.

Eliminate top and/or bottom pads in every practical instance.

Make scratch pads from stocks of obsolete letterheads, memorandum forms, and other unused inventory.

Cut the weight of paper stocks. (You tell the printer how long you expect a record to endure and he can tell you what stock to order.)

This advertisement prepared under the auspices of the War Advertising Council in co-operation with the Office of War Information and the War Production Board.

LET'S ALL USE LESS PAPER

Space for this advertisement contributed by PURCHASING



AFTER ALL—IT'S THE SPRING
THAT MAKES THE WATCH TICK!

Ask About SCIENTECH Spring Service

LEE SPRING COMPANY, Inc.
30 MAIN STREET BROOKLYN, N.Y.



ANOTHER
SPECIAL BY
PROGRESSIVE

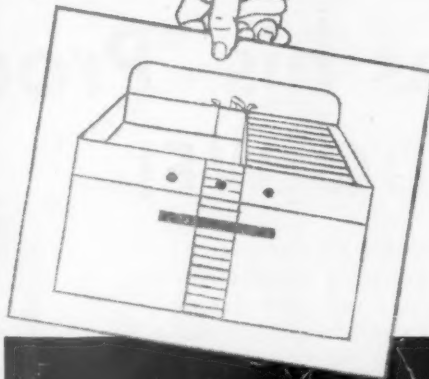


Ask for design help.
Item illustrated is a
"special," of which no
samples are available.

Special heads, threads,
and finishes—on fasten-
ings of any metal or
alloy adapted to cold-
spool—are Progressive's
specialty. Weekly output
25,000,000.

The PROGRESSIVE MFG. CO.
TORRINGTON 42 NORWOOD ST. CONNECTICUT

THIS IS MAYBE...



But this is Sure

Planning for after the war is secondary to producing plenty
of War equipment right now.

However, we are proud of our organization's ability to man-
ufacture a diversity* of products, and realize this experience
has taught us a lot, which will be most beneficial when we
start planning Kitchen Equipment for **AMERICAN** homes.

* JEEP BODIES, TRAILERS, OUTER WINGS, TOP CENTER SECTIONS, TOP TURRET DECKS FOR
FAMOUS LIBERATOR. OUTER WINGS FOR VULTEE VENGEANCE DIVE BOMBER, MANIFOLDS.

Photograph shows assembly of sides and bottom of trailer body for welding

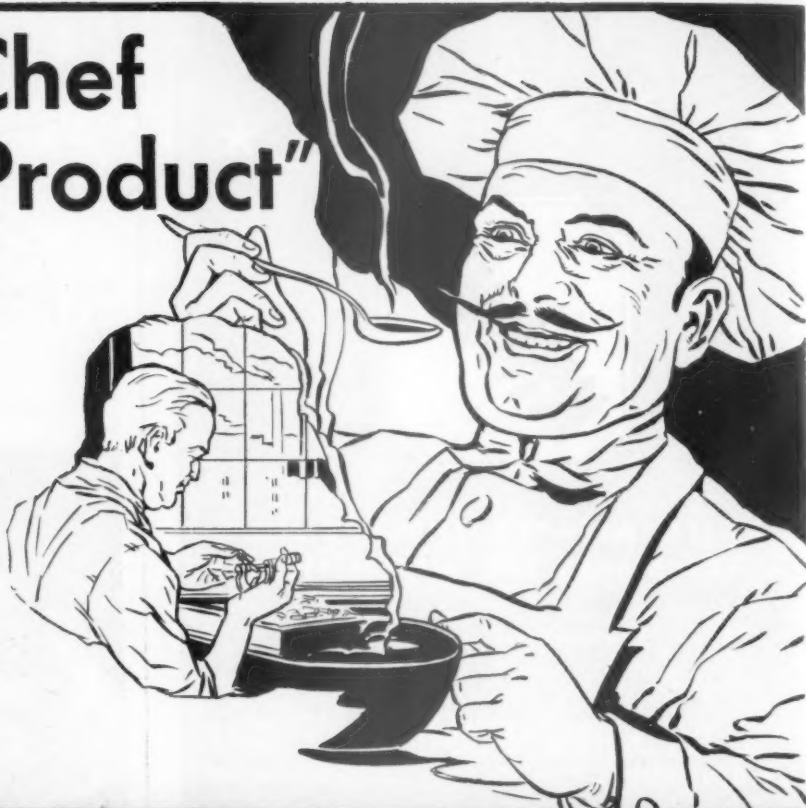


AMERICAN CENTRAL
MANUFACTURING CORPORATION
CONNERVILLE · INDIANA

The Good Chef Tastes his "Product" --SO DO WE!

When a chef tastes his consomme or his ragout, he really "mikes" it. He uses his tongue. We use a gage! The result is the same in either case—a job well done.

In the manufacture of Newton Screw Machine Products, not only is every job set up right, but meticulous care is taken to see that tolerances are uniformly maintained. If you appreciate this kind of watchfulness, let us know your needs as early as possible. We will do our best to meet them promptly. Any metal; sizes up to 1 1/4". Special experience in ALUMINUM.



NEWTON SCREW MACHINE PRODUCTS
THE NEWTON MANUFACTURING CO., PLAINVILLE, CONN.

MORE

SERVICE AND PROTECTION

with Surety Sureseal Synthetic

**GLOVES
APRONS
SLEEVES**

Surety's remarkable Sureseal synthetic means super resistance to acids, chemicals, oils, solvents, paints. Endorsed by users everywhere as "Quality that endures." . . . Write for new Surety bulletins, get complete information on gloves, aprons and sleeves.

THE *Surety*

RUBBER COMPANY
CARROLLTON, OHIO



Hodell CHAINS for War



--and for Post-War, too!

Today hundreds of different Hodell chain assemblies—some with attachments, some without—are playing a vital part in the production of America's tools of war. If chains figure in your wartime production—or in your post-war plans—let Hodell engineers help you. Send blueprints for a prompt estimate.

ESTABLISHED 1886

THE HODELL CHAIN CO.
CLEVELAND 3, OHIO

(Continued from page 326)

advantages over the hitherto conventional "hot dip" tinning of strip steel. Electroplating deposits tin in coats of more nearly uniform thickness than were ever possible heretofore. Electroplating processes end themselves to more accurate control. Hence, the new method applies coats in the exact thickness required to meet specifications which may be varied according to the use for which the product is designed.

1 1 1

CELLULOSE PLASTICS

THE War Production Board has announced that drastic steps are being taken to reduce the inflated requests for cellulose plastics.

On September 2, a special direction was promulgated, pursuant to the provisions of Allocation Order M-326-a, which specified that no person shall place purchase orders with all suppliers for cellulose plastics to be put in process of manufacture during any one calendar month if the amounts covered by such purchase orders exceed the amount he can mold or fabricate within a thirty-day period, commencing from the date of delivery of the subject material.

Penalty Total Denials

A recent spot check revealed that fourteen molders, with a capacity of approximately 1,500,000 pounds per month, had placed purchase orders for cellulose plastics for October in excess of 4,000,000 pounds. These fourteen firms will receive total denials, and a downward revision of their declared requirements will be necessary before their applications for material can be reconsidered.

War Production Board officials advise that similar monthly spot checks will be made as long as the plastics industry fails to cooperate in this effort to reduce the current dangerous inflation. In the face of such inflation, the equitable distribution of any material is impossible, and it is felt that sufficient quantities of cellulose plastics can be made available for good civilian usages, if requests are brought down to the actual consumption level.

1 1 1

SEEK WIDER UTILIZATION OF PIGSKIN LEATHER

A TASK group has been appointed to investigate the possibility of increasing leather supplies through greater utilization of domestic pigskins, according to Harold Connett, Chief of the Leather and Shoe Branch, WPB.

The slaughter of hogs average approximately 80 million head annually. However, only small amounts of leather are now produced from this kill, because the skin is usually left on the cuts of meat in the form of rind. It is hoped that substantial additions to the leather supply may result from this investigation, despite the fact that there are serious obstacles to be overcome.

The task group has been requested to investigate the suitability of pigskin leather for upper leather, sole leather, gloves leather, and other uses, and the steps necessary to accomplish the maximum leather production from the hog slaughter.

The task group, consists of representatives of the various industries involved in utilizing pigskin leather.

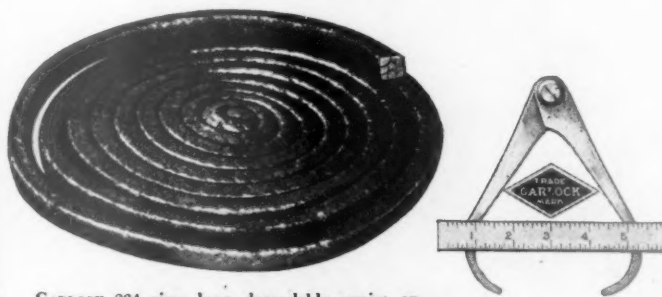


Garlock Products

Help Keep Things Moving!

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THAT GADGET IS *Safe?*"

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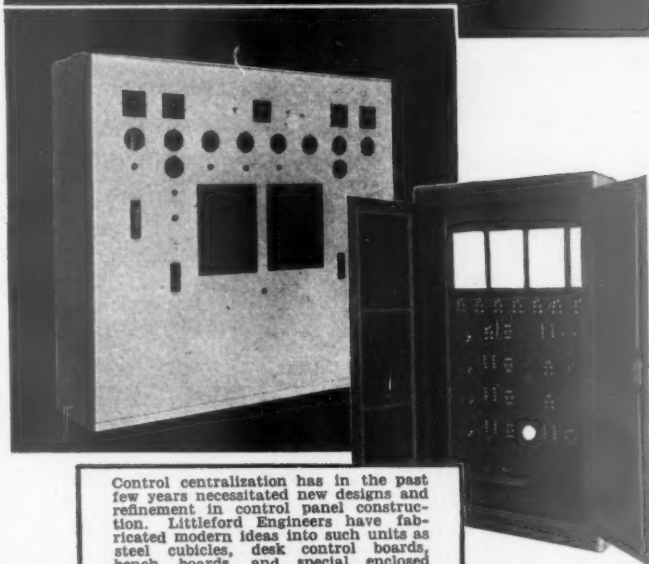
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REDUCES GLARE-IMPROVES ACUITY-RELIEVES STRAIN

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WOOD PULP PRICES INCREASED

AS an emergency measure to assist in maintaining the production of vitally needed supplies of wood pulp, the Office of Price Administration announces that it has raised the ceilings of producers on four major wood pulp grades. Screenings of the same grades and side-runs directly related to them also are given higher ceilings: The increases follow:

1. The groundwood pulp ceiling on all sales in the United States, including imports from Canada, is increased \$4 a ton. The new ceiling is \$50 a ton. Standard newsprint side-runs, which are used for the same purpose as groundwood pulp, are likewise increased \$4 a ton to a new ceiling of \$50 a ton. An additional increase of \$3 a ton is permitted for groundwood pulp that has been dried on paper machines. Only a small quantity is dried in this way. Groundwood screenings are increased \$2 a ton, the new ceiling being \$32 a ton.

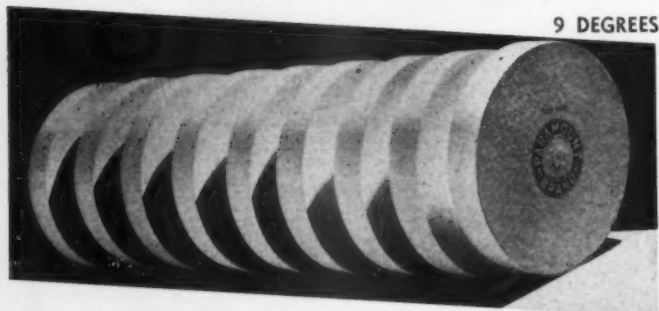
2. Soda pulp ceilings on all sales in the United States, including imports from Canada, are increased \$6 a ton. The new ceiling on bleached soda pulp is \$72 a ton. The new ceiling on unbleached soda pulp is \$68 a ton.

3. Ceilings are raised on sulphite produced in the United States as well as on all sulphite imports produced in Canada. Bleached sulphite ceilings are increased \$10 a ton to \$86 a ton for softwood and to \$83.50 for hardwood. Unbleached sulphite ceilings are increased \$8 a ton to \$74 a ton for softwood and to \$71.50 for hardwood. Sulphite screenings are raised \$5 a ton to \$43.50 a ton.

(Amendment No. 9 to Maximum Price Regulation No. 114).

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"America's Oldest Felt Manufacturers"



Ranging from EXTRA SOFT TO ROCK HARD

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We make felt wheels in 9 different degrees of hardness and in a wide range of diameters and thicknesses.

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MRO INCREASES

Information which should be given by persons applying for increases in their maintenance, repair and operating supply MRO) quotas under CMP Regulation No. 5, has been spelled out in Direction No. 18 to that Regulation, the CMP Division of the WPB announces. Items of information which should be given are:

Name of product (s) manufactured or description of services rendered;

Show what quarterly quota you were authorized under paragraph (f) in 1943. (If operating on a seasonal basis, show for each quarter of 1943). If you received a special authorization for any quarter, show that for each such quarter in addition to the "base" quota;

Statement of total dollar value of deliveries of your product, in 1942, and first and subsequent quarters of 1943, by quarters. Show deliveries for each quarter by principal Claimant Agencies;

Statement of total amount of MRO requested to be authorized per quarter. This should include the base quota already permitted by paragraph (f), (1), (2), or (3) plus the increase requested;

Statement of total amount expended during 1943 for minor capital additions under paragraph (b) (3) of the regulation;

Statement of deliveries of your product scheduled for quarters for which MRO increase is requested; and

Any additional information which may be pertinent to proper evaluation of the application.

If any of the above questions do not apply to a specific business, information which is comparable to that requested should be set forth in the applicant's letter. All such applications should be filed with the War Production Board, Washington 25, D. C., Reference: CMP Regulation No. 5.

TISSUE TIPS by VICTORIA



IT WOULDN'T BE HALF
BAD HERE, JOE -

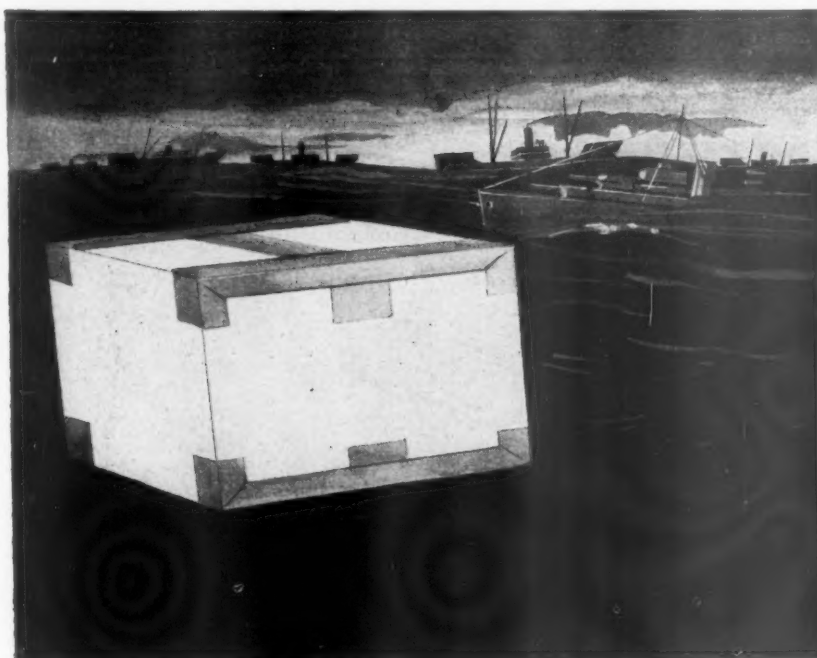


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Regular SAFETEX tape on waterproof paper backing.

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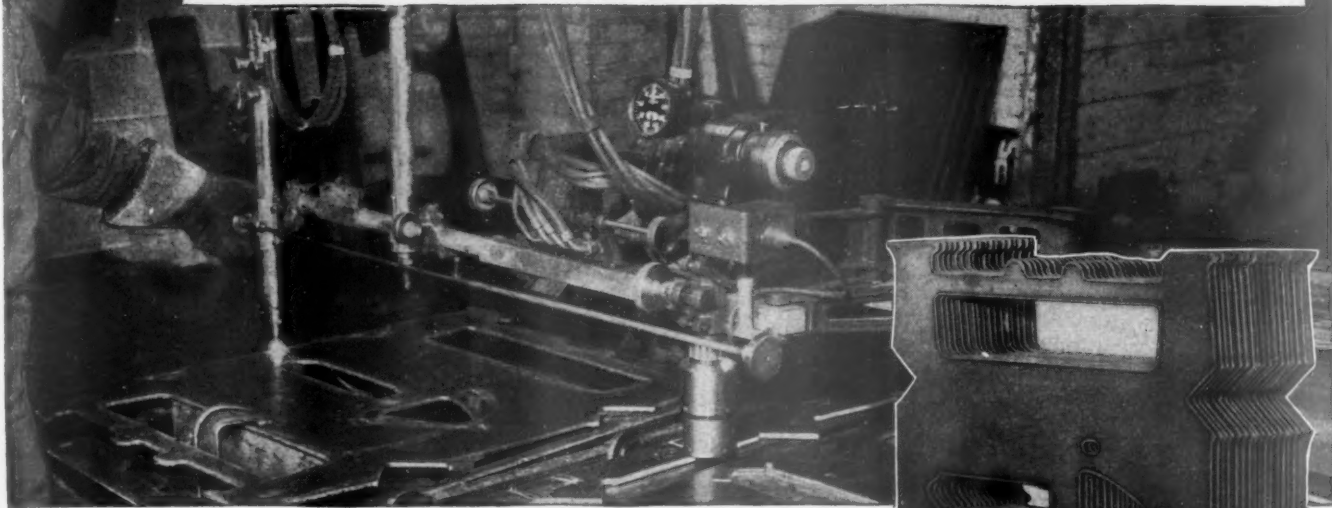
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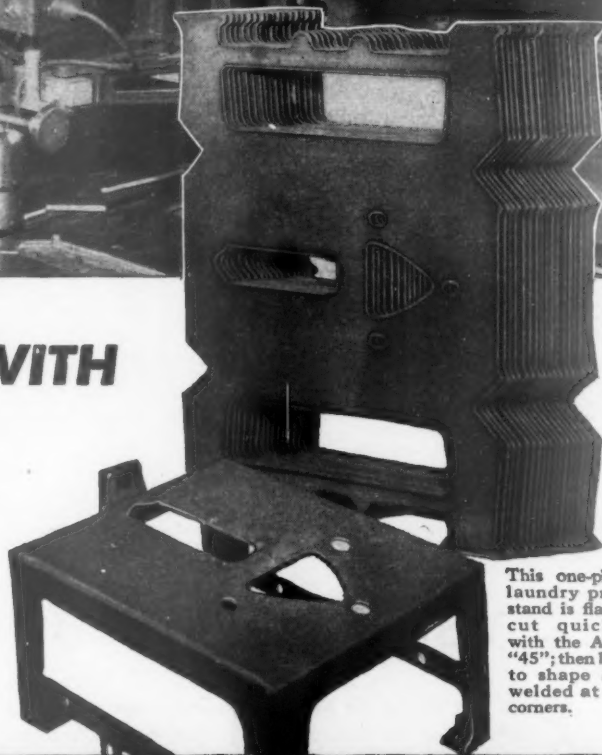


OVER 30" PER MINUTE WITH THE Airco "45" TIP

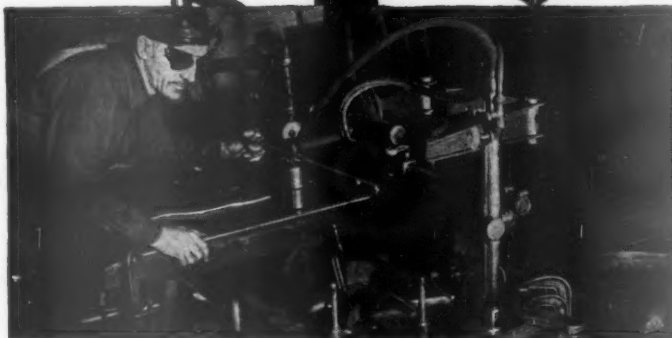
When manufacturers want really fast machine gas cutting, they use the Airco "45" High Speed machine cutting tip.

For example, De Bourgh Manufacturing Company, Minneapolis, Minn., designed a simplified one-piece laundry stand (shown at right) to be flame-cut out of 1/4" mild steel plate. Using an Airco "45" No. 0 tip, they cut the entire stand contour in one operation at a speed of over 30" per minute. 28 lineal feet of cutting with eight separate starts were required for each stand.

This performance is typical of the increased cutting speed provided by the Airco "45." Thanks to its divergent exit design and its use with higher gas pressures, the Airco "45" exceeds by 20% to 30% cutting speeds possible with standard design tips. For additional information, write your nearest Air Reduction office.



This one-piece laundry press stand is flame-cut quickly with the Airco "45"; then bent to shape and welded at the corners.



Stack cutting laundry press parts out of 10 gauge steel—ten pieces at a time. With the Airco "45" tip, cutting speed was 14" per minute.

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★ Facts About PURCHASING Magazine

PURCHASING is the National magazine devoted to the interests of the men responsible for the procurement of equipment and materials of production in America's leading industries. Many of our friends have expressed an interest in its background and its editorial policies. PURCHASING adheres to one broad-gauged policy and that is to help the men in Purchasing earn their rightful place in the sun as the key-men of American industry.

Incident to their activities in the war effort, Donald Nelson, Chairman of the War Production Board, characterized them as being "the most important group in the United States today." It is the purpose of PURCHASING to help Purchasing Agents maintain this prestige and to secure from management full recognition of the role they play in keeping the wheels of industry turning, not only under the stress of war, but in times of peace.

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Advertising forms close on the 10th of the month preceding date of publication and copy and full instructions must be in our hands by that date.

PURCHASING is a member of the ABC (Audit Bureau of Circulation), and also the ABP (Associated Business Papers).

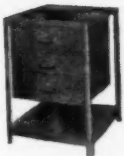
PURCHASING maintains offices at 205 East 42nd Street, New York 17, N. Y.; in the Leader Building, Cleveland, Ohio; and, 333 North Michigan Avenue, Chicago, Ill. In San Francisco and Los Angeles, Calif., it is represented by Duncan A. Scott & Company.

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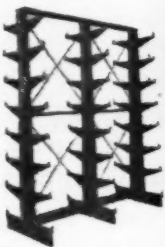


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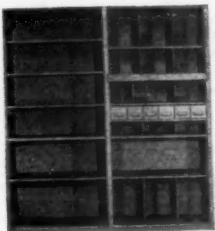
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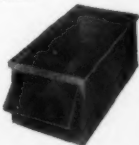
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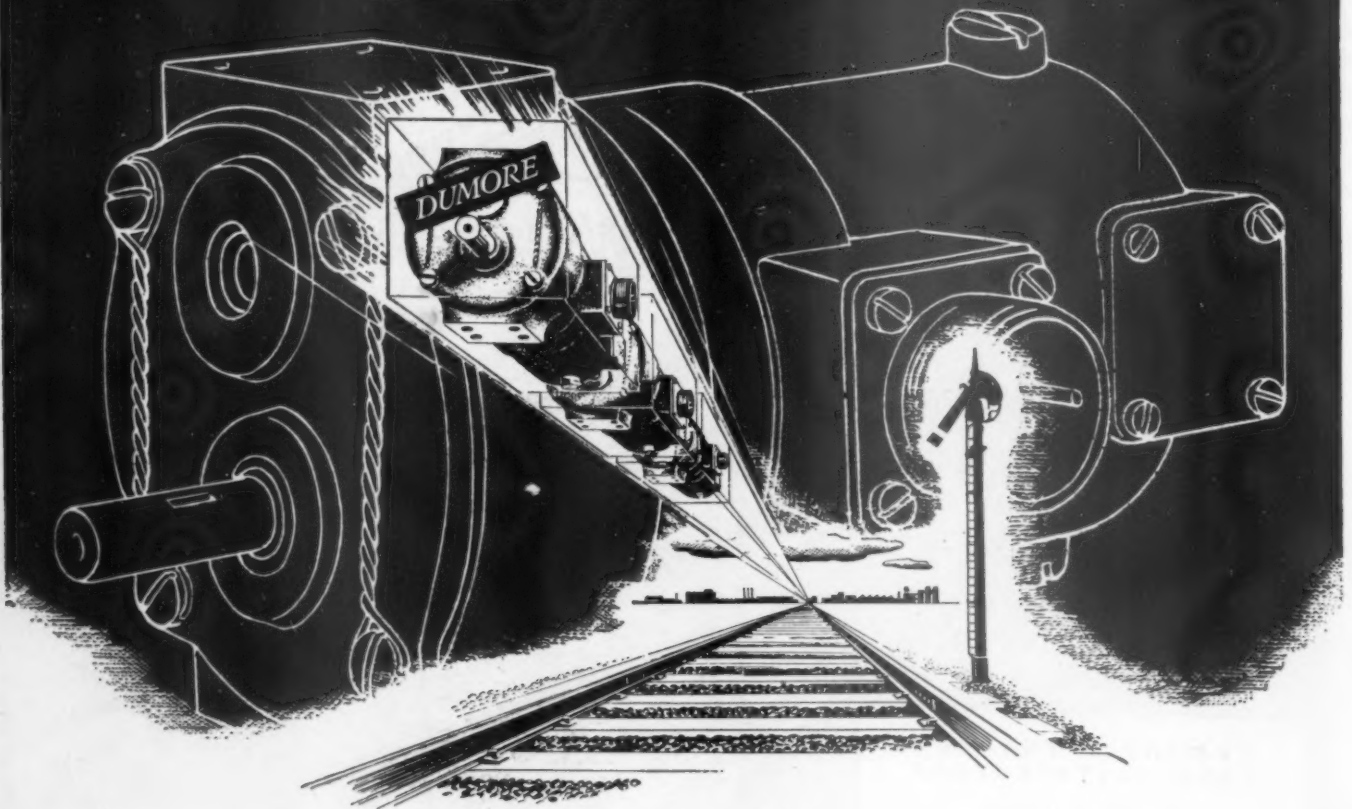
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POWER HOURS

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FRACTIONAL HORSEPOWER MOTORS

"MOTOR-PLAN" YOUR
POST-WAR PRODUCT, NOW!



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Director, Shipbuilding Division, WPB

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You also see a picture of what America's valve industry can do when it puts its heart into a job.

For the Missouri, with thousands of valves guarding its vast network of piping, typifies the achievements of this country's valve manufacturers in supplying our ships and war-plants with incredible quantities of this vital equipment.

Since Pearl Harbor, the valve industry has performed the miracle of expanding output seven and one-half times! It has done this without any comparable expansion of its facilities... and, equally important, without any sacrifice of quality.

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13,000 VALVES

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EASY TO INSTALL. Comes in 10-foot lengths with standard fittings and accessories. The Westinghouse Cantilever Hanger is simplest device of its kind. Wrench, screw driver, block and tackle only tools required.

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BUS
DUCT**
WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

FLEXIBLE—CONVENIENT
SECONDARY POWER DISTRIBUTION
FOR TODAY AND TOMORROW

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...before buying *Facts* BUS DUCT

Industrial distribution systems must be flexible to meet war's constantly changing demands ... and must fit readily into post-war conversion plans.

Westinghouse Victory Bus Duct meets both today's and tomorrow's requirements. It has many exclusive features contained in no other type of duct. A few of its outstanding advantages are listed above.

Bus Duct **FACTS** are contained in Bulletin 3286. This bulletin is a concise ... complete ... usable handbook on Bus Duct. It tells why Victory Bus Duct should be used ... why it meets Limitation Order L-273 ... why every rating carries complete Underwriters' approval. In addition, it gives data on plug-ins and fittings; dimension data; and specifications.

Ask your Westinghouse representative for a copy or write Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., Dept. 7-N.

J-60544



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